

A Cosmetologist's Introduction to Anatomy and Physiology

Teacher Edition



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A Cosmetologist's Introduction to Anatomy and Physiology

First Edition

Teacher Edition

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Modules of Instruction

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Module 2: Biochemistry and Microbiology
Module 3: Infection, Immunology, and Sanitation
Module 4: Tissues
Module 5: Integumentary System
Module 6: Skeletal System
Module 7: Muscular System
Module 8: Nervous System
Module 9: Circulatory System
Module 10: Respiratory, Digestive, and Urinary Systems

A Cosmetologist's Introduction to Anatomy and Physiology

Foreword

Exemplary teachers are considered knowledge conveyance agents who facilitate learning. Notable teachers are intense experts in their field and are passionate concerning transference of knowledge from one area of life to another to ensure their students' success. Because of skillful teachers, the instructional materials in *A Cosmetologist's Introduction to Anatomy and Physiology* have been designed to be integrated into the regular cosmetology curriculum and not to be used as a stand-alone course.

The knowledge and skills found in this publication are organized as basic building blocks for improving student's performance on state examinations and improving their ability to be safe and successful in today's workforce. The activities can be interwoven into the everyday practical application of technical cosmetology skills learned. For example, a student may review mentally the names of the bones and muscles and the locations of each while performing a shampoo, facial, manicure or pedicure. The teacher may ask the student to recall information concerning the integumentary system while performing an analysis of the scalp for a chemical service. Activities also include strategies that reinforce language arts, science, and math skills necessary to provide a means for the teacher to help strengthen the academic skills of the student as well as the technical skills needed to be profitable in the cosmetology industry.

A special feature has been added to *A Cosmetologist's Introduction to Anatomy and Physiology*. Teacher supplements located in the teacher edition incorporate several literacy techniques identified by Dr. Mark A. Forget in his book, *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Additional teaching strategies and activities developed by Pat Todd are also included to help teachers assist students in improving their reading comprehension skills.

As you use these instructional materials, we hope that you will find that they contribute to the quality of your course. If any problems occur or if you have any suggestions for improvement of the materials, please call or write us.

Lydia Hess, Chair
Board of Directors
MAVCC

Jane Huston
Executive Director
MAVCC

A Cosmetologist's Introduction to Anatomy and Physiology

Acknowledgments

Appreciation is extended to those individuals who contributed their time and talent to the development of *Anatomy and Physiology*, ©2001. The contents of *A Cosmetologist's Introduction to Anatomy and Physiology*, ©2008, were derived from the original publication and have been revised to assist cosmetology students in gaining practical knowledge regarding the organization of the human body; infection, immunology, and sanitation; major elements and compounds found in the human body; and its major body systems. Special thanks go to Becky Davis for providing Pat Todd with useful resources during the development process.

Thanks are extended to Rick Lomenick, electronic publishing technician; to Susie Kucko for the cover design; to Jane Huston for coordinating this project; to Cheryl Dorris for proofreading modules; to Ann Stolfa for creating the Teacher CD; and to the Oklahoma Department of Career and Technology Education printing staff for printing.

Appreciation is also extended to Nancy Hilley, illustrator, and to Creative Services at the Oklahoma Department of Career and Technology Education for providing the artwork used within this publication.

A Cosmetologist's Introduction to Anatomy and Physiology

Use of This Publication

A Cosmetologist's Introduction to Anatomy and Physiology is available in both a teacher and student edition. The contents of these materials are tied to measurable and observable learning outcomes that were identified and validated by the Anatomy and Physiology advisory committee.

MAVCC instructional materials are competency-based, and modules are designed for use in more than one lesson or class period. Careful study of each module will help to determine the following:

- Amount of material that can be covered in each class period;
- Supplies and materials required for assignment sheets and job sheets;
- Resources/supplementary materials you can order/use to reinforce instruction;
- Amount of time needed in the computer lab for students to research topics on the Internet, and
- Amount of class time needed for students to complete assignment and job sheets.

Teachers are encouraged to supplement, localize and personalize these materials to meet the needs of individual students, the community, and prospective employers.

Teacher Edition

The complete teacher edition consists of introductory pages, teacher pages, the student guide and student workbook. The introductory and teacher pages are provided on CD-ROM. The student guide is spiral bound, and the student workbook is perfect bound with perforated pages so the student can detach the assignment/job sheets to turn in or for ease of use.

For added flexibility, each module is individually numbered beginning with a “T” for teacher page, followed by the module number and page number.

Example:

Page 17 of Module 3 in the teacher pages is represented as T 3–17.

Use of This Publication

Pages in the student guide are numbered beginning with the module number, followed by the page number.

Example:

Page 7 of Module 5 in the student guide is represented as Page 5–7.

MAVCC—A Cosmetologist's Introduction to Anatomy and Physiology

Page 5–7

Pages in the student workbook are sequentially numbered beginning with page 1.

MAVCC—A Cosmetologist's Introduction to Anatomy and Physiology

Page 1

For group instruction, the teacher should determine the best way to teach each objective and allow for student participation. For self-paced or individualized instruction, students should be provided with opportunities to become involved in planning and being responsible for their own education.

Introductory Pages



*Designates items that may not appear in every publication.

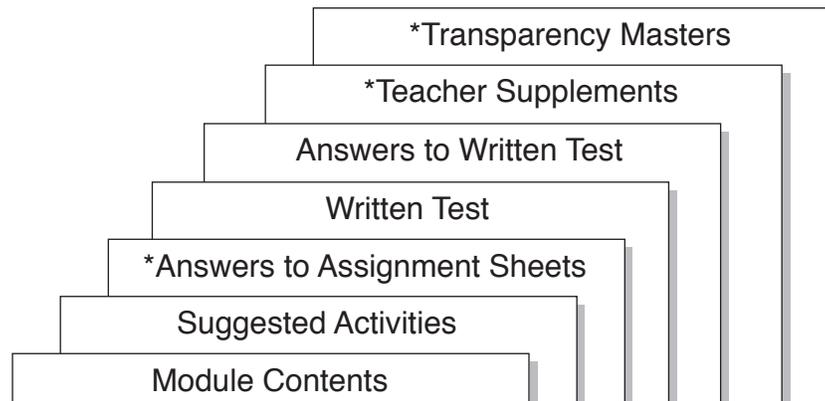
Use of This Publication

The following introductory materials are included on this CD-ROM, if applicable, and contain useful information to assist teachers and administrators in planning for instruction. They are saved in PDF format or as a Word® file and may be printed as needed.

- ❑ **Training and Competency Profile.** This form may be used “as is” or may be modified by using the Word® file on the CD-ROM. It is used to record information about each student, such as enrollment dates, class attendance, and work experience, and to document the student’s mastery of specific job competencies. It can also be used to provide information about the student’s qualifications to potential employers and/or for entry into advanced training programs.
- ❑ **National Skills and/or State Duty/Task Crosswalk.** This document identifies the national and/or state skill standards covered in this publication and lists specifically where these skills are located by module number and objective.
- ❑ **Instructional/Task Analysis.** This document provides a quick review of the contents of this publication by identifying the cognitive skills (what the student should know) and psychomotor skills (what the student should be able to do) addressed in each module.
- ❑ **Basic Skills Icons and Classifications.** This page provides a reference guide of the graphic symbols that are used to identify the basic academic and workplace skills included in each assignment sheet.
- ❑ **Basic Skills Matrix.** This document graphically summarizes the academic and workplace skills training included in the instructional materials, module by module. It should be helpful to teachers in planning for instruction, and to administrators as documentation that basic skills are being taught as part of the training.
- ❑ **Tools, Equipment, and Materials List.** This document provides a comprehensive list of those items needed for students to complete training. It also can assist administrators and teachers in determining program costs.

Use of This Publication

Teacher Pages



*Designates components that may not appear in every module.

The following teacher components are included for each module of instruction and are provided in PDF format or as a Word® file on the CD.

- Suggested Activities.** This component assists teachers during the preparation stage of the teaching/learning process by providing an instructional plan, teaching suggestions, a list of references used in the development of each unit, and a list of suggested supplemental resources (books, posters, pamphlets, videotapes, computer software, and Internet sites) that may be used to enhance instruction.
- Answers to Assignment Sheets.** An answer key is provided, when applicable, to assist the teacher in evaluating student performance on a given assignment.
- Written Test.** This component provides criterion-referenced evaluation of every cognitive objective listed in the module. It may be printed “as is” for student use, or modified to add/delete test items by using the Word® file included on the CD. Test may be divided into quizzes covering three or four objectives at a time, and test items from the modules may be used for final tests at the end of each term if desired.
- Answers to Written Test.** This component is designed to assist the teacher in evaluation of student performance on the written test. If test items are added/deleted, the answer key should be modified by using the Word® file included on the CD.
- Teacher Supplements.** MAX Teaching strategies that “help students learn new subject matter while acquiring literacy skills” have been included as teacher supplements in this publication. These optional activities will help students become more actively engaged in their learning and will provide them with tools for lifelong learning. These teacher supplements may be duplicated for student use and are marked accordingly.

Use of This Publication

 **Learning Activities Sheet.** This component provides a model for teachers to use in implementing a self-paced or individualized program, and guides the student through the required components in the student guide and workbook. It is provided as a Word® file so that the teacher can modify the learning steps as needed to incorporate resources available in the classroom (videotapes, computer software, magazines, etc.) and to address instructional strategies that may be needed in enhance learning for each student.

A copy of the Learning Activities Sheet is located in the student guide and may be used “as is.” If the instructor has elected to modify the contents, that version should be substituted for the one provided in the student guide.

The following icons will be used on the learning activities sheet to denote steps that require additional resources:



Read a book, magazine, or journal article



Use a CBT program or other software application



Access a site on the World Wide Web



Look at PowerPoint® or other computer presentation



Watch a videotape

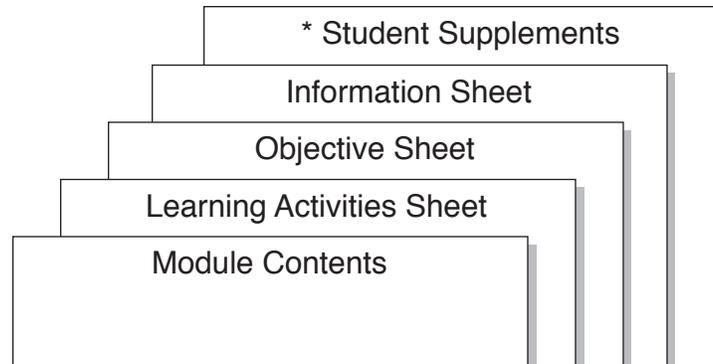
 **Transparency Masters.** Illustrations and additional information are provided to direct students’ attention to the topic of classroom discussion and to clarify and reinforce objectives included in the module. Transparencies allow the student to see as well as hear the information being presented, thus reinforcing the learning process. They may provide illustrations, charts, schematics, or additional information needed to clarify and reinforce objectives included in the module. Some of these items may also appear with the appropriate objectives in the information sheet in the student edition. Transparency Masters are provided in the following formats.

- Provided as paper copies so the teacher can make overheads to use in a projector.
- Provided as a PowerPoint® presentation and may be used “as is” or may be modified by the teacher to include additional information or illustrations.

Use of This Publication

Student Edition

Student Guide



*Designates components that may not appear in every module.

For best results, students should be provided with a copy of the student guide and should be allowed to take notes in the margins as additional information is provided by the instructor or as the student acquires additional information through library or Internet research.

❑ **Learning Activities Sheet.** A Learning Activities Sheet is included in the student guide. The teacher should modify the learning steps as needed to incorporate resources available in the classroom (videotapes, computer software, magazines, etc.) and to address instructional strategies that may be needed to enhance learning for each student. Final copies should be distributed for student use.

❑ **Objective Sheet.** This component summarizes each module for the student and teacher. The objective sheet is based on established performance objectives that state the goals for successful completion of a module. Objectives are stated in two forms: module objectives that state the expected performance of each student after completion of the module and specific (enabling) objectives that state what the student must be able to do to reach the module objective.

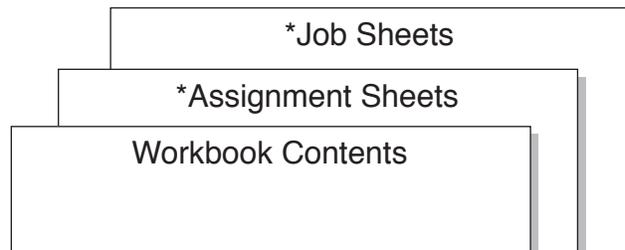
The objectives should be stressed throughout the teaching/learning process. This will help answer any questions concerning performance requirements for each instructional module. The objectives can also help determine teaching strategies and instructional methods.

Teachers should modify, delete, or add objectives in order to meet the needs of the students and community. When objectives are added, the teacher should remember to supply the needed information, assignment and/or job sheets, and criterion-referenced test items to cover the new objectives.

Use of This Publication

- ❑ **Information Sheet.** This component provides the student with the essential information for meeting the cognitive objectives in the module. Teachers will find that the information sheet serves as an excellent guide for presenting background knowledge necessary to develop the skills specified in the module objective. Students should read the information sheet before the information is discussed in class. Space is provided in the margins for students and teachers to add notes that clarify and/or expand upon the information presented.
- ❑ **Student Supplements.** This component is included in a module when additional information is needed in order for students to complete one or more of the assignment and/or job sheets. Students are not directly tested over the information presented in a supplement; however, their ability to apply this information may be evaluated in the completion of assignment and/or job sheets.
- ❑ **Glossary.** This optional item is a compilation of the key terms and definitions included in each module and terms are presented in alphabetical order.

Student Workbook



*Designates components that may not appear in every module.

The student workbook is an integral part of the student materials and should be provided to each student. It contains the pen-and-paper exercises and skill tests necessary for student mastery of the course.

- ❑ **Assignment Sheets.** The assignment sheets address the learning levels at or above the application level of Bloom's taxonomy. They provide students with an opportunity to use higher-order thinking skills, such as problem solving, synthesizing, analyzing, and evaluating. In addition, they may provide additional opportunities for students to develop their language skills.

Assignment sheets can be paper-and-pencil activities, as well as those using computer software, videotapes, models, handouts, or other resources as appropriate. Criteria are provided to evaluate student performance objectively.

Use of This Publication

Job Sheets

✓ **Note:** No job sheets have been included in this publication due to content.

As you use these instructional materials we hope that you will find that they contribute to the quality of your program. If any problems occur or if you have any suggestions for improvement of the materials, please write us at 1500 West Seventh Avenue, Stillwater, OK 74074-4364, or E-mail us at mavcc@mavcc.com.

A Cosmetologist's Introduction to Anatomy and Physiology

Instructional/Task Analysis

Related Information: What the Student Should Know

Application: What the Student Should Be Able to Do

Module 1: Organization of the Human Body

- | | |
|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| 1. The terms <i>anatomy</i> and <i>physiology</i> | 7. Complete the crossword puzzle of terms (Objectives 1–6) |
| 2. General regions of the body | 8. Construct a model of an organ of the human body |
| 3. Major body structures in order of increasing complexity | 9. Analyze a cosmetology scenario |
| 4. Functions of the major organ systems | 10. Complete Module 1 review |
| 5. Major organs and structures in each of the major organ systems | |
| 6. Primary physiological characteristics of the body that are affected by the hormones of the endocrine system | |

Module 2: Biochemistry and Microbiology

1. The terms *biochemistry* and *microbiology*
2. The role of chemistry in human health
3. The term *homeostasis*
4. The terms *element* and *atom*
5. Parts of an atom
6. The term *molecule*
7. The terms *compound*, *mixture*, and *solution*
8. Primary role of each of the principle elements and compounds in the human body
9. Role of electrolytes in human health
10. Role of acids and bases in human health
11. Cell theory
12. Principal types of protoplasm
13. Major parts of a cell

Instructional/Task Analysis

Related Information: What the Student Should Know

Application: What the Student Should Be Able to Do

Module 2: Biochemistry and Microbiology (continued)

- | | |
|----------------------------------------------------------|----------------------------------------------------------------------|
| 14. Functions of the major parts of a cell | 25. Complete the crossword puzzle of terms (Objectives 1–10) |
| 15. Major parts of a cell nucleus | 26. Complete the crossword puzzle of terms (Objectives 11–18) |
| 16. Specialized structures in cells | 27. Construct a model of a typical cell |
| 17. Functions of the specialized structures in cells | 28. Complete the crossword puzzle of terms (Objectives 19–24) |
| 18. Functions of a cell | 29. Develop a presentation on bacteria, viruses, fungi, or parasites |
| 19. Classes of microorganisms | 30. Analyze cosmetology scenarios |
| 20. Class of microorganisms as classified by their shape | 31. Complete Module 2 review |
| 21. Characteristics of bacteria | |
| 22. Characteristics of viruses | |
| 23. Characteristics of fungi | |
| 24. Common parasites that afflict humans | |

Module 3: Infection, Immunology, and Sanitation

1. The term *infection*
2. The effects of infection on a human host
3. Methods used to reduce the spread of infection
4. Types of infections and diseases
5. Role of the body's portals of entry and portals of exit in the spread of infectious diseases
6. Functions of the body's physical barriers to infection
7. Types of immunity
8. Methods used to control the spread of microorganisms
9. Reasons certain industries must control the growth of microorganism
10. Types of antimicrobial-control methods

Instructional/Task Analysis

Related Information: What the Student Should Know

Application: What the Student Should Be Able to Do

Module 3: Infection, Immunology, and Sanitation (continued)

- | | |
|--------------------------------------------------------------------|---------------------------------------------------------------------------|
| 11. Factors that contribute to the spread of nosocomial infections | 13. Complete the crossword puzzle of terms (Objectives 1–4) |
| 12. Organisms that cause common nosocomial infections | 14. Complete the crossword puzzle of terms (Objectives 5–12) |
| | 15. Conduct a sanitation inspection of the salon/laboratory and classroom |
| | 16. Analyze cosmetology scenarios |
| | 17. Complete Module 3 review |

Module 4: Tissues

- | | |
|---------------------------------------------------------|--------------------------------------------------------------|
| 1. The term <i>tissue</i> | 11. Complete the crossword puzzle of terms (Objectives 1–10) |
| 2. Basic types of tissue and their descriptions | 12. Develop a presentation on basic tissue of the human body |
| 3. Functions of the basic types of tissue | 13. Complete Module 4 review |
| 4. Types of connective tissue and their functions | |
| 5. Basic types of nerve tissue | |
| 6. Functions of the basic parts of a neuron | |
| 7. How neurons function in the nervous system | |
| 8. Factors that determine muscle-tissue classifications | |
| 9. The term <i>organ</i> | |
| 10. How organ systems function | |

Module 5: Integumentary System

1. The term *integument*
2. Major structures that make up the integument
3. Characteristics of the skin
4. Functions of the skin
5. Major structures of the skin

Instructional/Task Analysis

Related Information: What the Student Should Know

Application: What the Student Should Be Able to Do

Module 5: Integumentary System (continued)

- | | |
|--------------------------------------------------------------|-------------------------------------------------------------------|
| 6. Layers of the epidermis | 18. Complete the crossword puzzle of terms (Objectives 1–7) |
| 7. Layers of the dermis | 19. Complete the crossword puzzle of terms (Objectives 8–14) |
| 8. The term <i>auxiliary appendage</i> | 20. Complete the crossword puzzle of terms (Objectives 15 and 16) |
| 9. Characteristics of hair | 21. Complete the crossword puzzle of terms (Objective 17) |
| 10. Characteristics of nails | 22. Create a graphic organizer |
| 11. Functions of the glands in the skin | 23. Review the structures, layers, and glands of the skin |
| 12. Types of nerve endings found in the skin | 24. Analyze cosmetology scenarios |
| 13. Identification of the major structures of the integument | 25. Complete Module 5 review |
| 14. Common disorders and diseases of the scalp and hair | |
| 15. Common disorders and diseases of the sebaceous glands | |
| 16. Common disorders and diseases of the skin | |
| 17. Common disorders and diseases of the hand and nails | |

Module 6: Skeletal System

1. The term *skeletal system*
2. Functions of the skeletal system
3. Types of bones as classified by their location
4. The long bones of the skeleton
5. Major divisions of the human skeleton
6. Major bones of the anterior and posterior appendicular skeleton
7. Descriptions of the major bones of the cranium and face
8. Identification of the major bones of the cranium and face
9. Characteristics of the hyoid bone

Instructional/Task Analysis

Related Information: What the Student Should Know

Application: What the Student Should Be Able to Do

Module 6: Skeletal System (continued)

- | | |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| 10. Descriptions of the regions and the major bones and structures of the vertebral column | 14. Complete the crossword puzzle of terms (Objectives 1–6) |
| 11. Identification of the regions and the major bones and structures of the vertebral column | 15. Complete the crossword puzzle of terms (Objectives 7–13) |
| 12. Characteristics of the ribs and sternum | 16. Locate and identify bones of the cranium |
| 13. Major bones and structures of the ribs and sternum | 17. Locate and identify bones of the face |
| | 18. Analyze cosmetology scenarios |
| | 19. Complete Module 6 review |

Module 7: Muscular System

1. The term *muscular system*
2. Functions of the muscular system
3. Major classifications of muscle tissue
4. Major structures of skeletal muscles and their definitions
5. Identification of the major structures of skeletal muscles
6. Characteristics of the bone/muscle attachments of skeletal muscles
7. How skeletal muscles function
8. Terms that describe the functional characteristics of muscle tissue
9. Types of muscles as classified by their actions
10. Functions of the major muscle groups
11. Functions of the major muscles of the head, face, and neck
12. Identification of the major muscles of the head, face, and neck
13. Functions of the major muscles of the torso
14. Identification of the major muscles of the torso

Instructional/Task Analysis

Related Information: What the Student Should Know

Application: What the Student Should Be Able to Do

Module 7: Muscular System (continued)

- | | |
|-----------------------------------------------------|-------------------------------------------------------------------|
| 15. Functions of the major muscles of the arm | 19. Complete the crossword puzzle of terms (Objectives 1–8) |
| 16. Identification of the major muscles of the arm | 20. Complete the crossword puzzle of terms (Objective 9) |
| 17. Functions of the major muscles of the legs | 21. Complete the crossword puzzle of terms (Objectives 10–12) |
| 18. Identification of the major muscles of the legs | 22. Locate and identify major muscles of the head, face, and neck |
| | 23. Complete the crossword puzzle of terms (Objectives 13–16) |
| | 24. Complete the crossword puzzle of terms (Objectives 17–18) |
| | 25. Analyze cosmetology scenarios |
| | 26. Complete Module 7 review |

Module 8: Nervous System

1. The term *nervous system*
2. Functions of the nervous system
3. Major subsystems of the nervous system
4. Major subsystems of the peripheral nervous system
5. Major subsystems of the autonomic nervous system
6. The term *nerve tissue*
7. Basic types of nerve tissue
8. Functions of the major structures of a neuron
9. Identification of the major structures of a neuron
10. Types of neurons
11. Description of a reflex arc
12. Major structures within the spinal canal

Instructional/Task Analysis

Related Information: What the Student Should Know

Application: What the Student Should Be Able to Do

Module 8: Nervous System (continued)

- | | |
|---------------------------------------------------------|--------------------------------------------------------------|
| 13. Structure and function of the spinal cord | 15. Complete the crossword puzzle of terms (Objectives 1–5) |
| 14. Functions of the nerves of the head, face, and neck | 16. Complete the crossword puzzle of terms (Objectives 6–13) |
| | 17. Complete the crossword puzzle of terms (Objective 14) |
| | 18. Participate in a "Face Off" |
| | 19. Analyze cosmetology scenarios |
| | 20. Complete Module 8 review |

Module 9: Circulatory System

1. The term *circulatory system*
2. Functions of the circulatory system
3. Subsystems of the circulatory system
4. Major organs of the circulatory system
5. Major components of blood
6. The normal physical characteristics of blood.
7. Major components of blood plasma
8. The term *cardiovascular system*
9. Size and position of the heart
10. Major structures of the heart
11. Characteristics of the chambers of the heart
12. Characteristics of the major veins of the heart
13. Characteristics of the major arteries of the heart
14. Characteristics of the major valves of the heart
15. Identification of the major structures of the heart

Instructional/Task Analysis

Related Information: What the Student Should Know

Application: What the Student Should Be Able to Do

Module 9: Circulatory System (continued)

- | | |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------|
| 16. The term <i>vascular system</i> | 25. Complete the crossword puzzle of terms (Objectives 1–7) |
| 17. Major structures of the vascular system | 26. Complete the crossword puzzle of terms (Objectives 8–24) |
| 18. Major arteries that extend from the aortic arch | 27. Construct a model of the human heart |
| 19. Identification of the major arteries of the systemic circulation system | 28. Research the route of a blood cell through the circulatory system |
| 20. Characteristics of capillaries | 29. Analyze cosmetology scenarios |
| 21. Characteristics of veins | 30. Complete Module 9 review |
| 22. The term <i>pulse point</i> | |
| 23. The term <i>blood pressure</i> | |
| 24. The term <i>lymphatic system</i> | |

Module 10: Respiratory, Digestive, and Urinary Systems

- | | |
|----------------------------------------------------------|--------------------------------------------------------------|
| 1. The term <i>respiratory system</i> | 12. Complete the crossword puzzle of terms (Objectives 1–11) |
| 2. Characteristics of pulmonary ventilation | 13. Participate in a "Face Off" |
| 3. Major organs and structures of the respiratory system | 14. Analyze cosmetology scenarios |
| 4. The term <i>digestive system</i> | 15. Complete Module 10 review |
| 5. Functions of the digestive system | |
| 6. The term <i>accessory glands</i> | |
| 7. Major organs and structures of the digestive system | |
| 8. Functions of the liver | |
| 9. The term <i>urinary system</i> | |
| 10. Functions of the urinary system | |
| 11. Major organs and structures of the urinary system | |

A Cosmetologist's Introduction to Anatomy and Physiology

Basic Skills Icons and Classifications

To assist teachers and students in identifying and documenting where academic and workplace skills are being taught, MAVCC has adopted a system that uses icons and a list of specific tasks to identify the skill or skills that are used in each assignment sheet and job sheet.

A matrix for each of the ten broad skill areas has been included in this edition and reflects key elements from *What Work Requires of Schools: A SCANS Report for America 2000*, a 1991 study by the U.S. Department of Labor; *Workplace Basics: The Skills Employers Want*, a three-year study conducted jointly by the American Society for Training and Development (ASTD) and the United States Department of Labor (DOL); and other national and state sources.

Each of the ten broad skill areas—reading, writing, mathematics, science, oral communication, interpersonal or relating, critical thinking, employability, social studies, and technology—is represented by the icon presented below.



Reading Skills

- Reading Comprehension
- Research/Reference
- Functional Reading



Writing Skills

- Language
- Composition
- Research
- Functional Writing



Math Skills

- Operation and Calculation
- Math Application
- Data Analysis and Display
- Functional Math

Basic Skills Icons and Classifications



Science Skills

- General Science
- Life Science
- Physical Science
- Earth Science



Oral Communication Skills

- Oral Presentation
- Listening
- Interactive Communication



Interpersonal or Relating Skills

- General Relating
- Teamwork/Cooperation
- Leadership/Influence



Critical Thinking Skills

- Cognitive Activities



Employability Skills

- Job Search/Selections
- Job Acquisition/Development
- Resource Management
- Job Safety



Social Studies Skills

- Information Analysis
- Social Studies Application
- Functional Social Studies



Technology Skills

- Selection
- Application
- Maintenance/Troubleshooting

Basic Skills Matrix

Module 1: Organization of the Human Body

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
7	Complete the crossword puzzle of terms (Obj. 1-6), A.S. 1		Reading	Reading comprehension	Applies what has been read to specific task
				Functional reading	Follows written directions; uses content area vocabulary
8	Construct a model of an organ of the human body, A.S. 2		Science	Life science	Applies knowledge of terms related to anatomy and physiology
				Reading	Research/Reference
			Reading	Reading comprehension	Interacts with text to form a personal interpretation
				Functional reading	Follows written directions
			Writing	Research	Takes notes; describes appropriate details
					Mathematics
			Science		
					Oral Communication
		Interactive communication	Works effectively in a group; communicates effectively with peers		
		Listening	Applies active listening skills; draws conclusions		
	Interpersonal	Teamwork	Gives/receives feedback; works with group to achieve goals		
		General relating	Participates in group activity		
	Technology	Application	Demonstrates ability to use computer, the Internet, and software to research subject matter		

Basic Skills Matrix

Module 1: Organization of the Human Body (continued)

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
9	Analyze a cosmetology scenario, A.S. 3		Reading	Reading comprehension	Acquires and analyzes information/ data; draws conclusions
				Functional reading	Follows written directions
			Writing	Language	States ideas clearly
			Science	Life science	Investigates health issues; applies principles of anatomy and physiology
			Interpersonal	General relating	Interacts with clients; identifies personal values or attitudes
			Leadership/ Influence	Obtains confidence of others	
			Critical Thinking	Cognitive activities	Identifies critical issues; draws conclusions; develops an action plan
10	Complete Module 1 review, A.S. 4		Reading	Reading comprehension	Demonstrates knowledge of anatomy and physiology
				Functional reading	Follows written directions
			Science	Life science	Applies knowledge of anatomy and physiology

Basic Skills Matrix

Module 2: Biochemistry and Microbiology

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
25	Complete the crossword puzzle of terms (Obj. 1-10), A.S. 1		Reading	Reading comprehension	Applies what has been read to specific task
				Functional reading	Follows written directions; uses content area vocabulary
26	Complete the crossword puzzle of terms (Obj. 11-18), A.S. 2		Science	Life science	Applies knowledge of terms related to biochemistry and microbiology and their relationship to the human body
				Reading	Reading comprehension
26	Complete the crossword puzzle of terms (Obj. 11-18), A.S. 2		Reading	Functional reading	Follows written directions; uses content area vocabulary
				Science	Life science
27	Construct a model of a typical cell, A.S. 3		Reading	Research/reference	Locates related Internet resources to compile data
				Reading comprehension	Interacts with text to form a personal interpretation
				Functional reading	Follows written directions
			Writing	Research	Takes notes; describes appropriate details
				Science	Life science
			Oral Communication	Oral presentation	Makes informative presentation; integrates visual resource into oral presentation; uses effective body language
				Interactive communication	Works effectively in a group; communicates effectively with peers
				Listening	Applies active listening skills; draws conclusions
			Interpersonal	Teamwork	Gives/receives feedback; works with group to achieve goals
				General relating	Participates in group activity
	Technology	Application	Demonstrates ability to use computer, the Internet, and software to research subject matter		

Basic Skills Matrix

Module 2: Biochemistry and Microbiology (continued)

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
28	Complete the crossword puzzle of terms (Obj. 19-24), A.S. 4		Reading	Reading comprehension	Applies what has been read to specific task
				Functional reading	Follows written directions; uses content area vocabulary
29	Develop a presentation on bacteria, viruses, fungi, or parasites, (A.S. 5)		Science	Life science	Applies knowledge of terms related to biochemistry and microbiology and their relationship to the human body
				Reading	Reading comprehension
			Writing	Research/reference	Selects/locates resources
				Language	States ideas clearly
				Composition	Composes presentation
			Science	Research	Takes notes
				Functional writing	Uses computer software to prepare presentation
			Oral Communication	Life science	Identifies/classifies living organisms; applies principles of biochemistry and microbiology
				Oral presentation	Makes informative presentation; integrates visual resource into oral presentation; uses effective body language
				Interactive communication	Works effectively in a group; communicates effectively with peers
Interpersonal	Listening	Applies active listening skills; draws conclusions			
	Teamwork	Gives/receives feedback; works with group to achieve goals			
	General relating	Participates in group activity			
Technology		Application	Demonstrates ability to use computer, the Internet, and software to research subject matter and develop presentation		

Basic Skills Matrix

Module 2: Biochemistry and Microbiology (continued)

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
30	Analyze cosmetology scenarios, A.S. 6		Reading	Reading comprehension	Acquires and analyzes information/ data; draws conclusions
				Functional reading	Follows written directions
			Writing	Language	States ideas clearly
			Science	Life science	Investigates health issues; applies principles of anatomy and physiology
			Interpersonal	General relating	Interacts with clients; identifies personal values or attitudes
			Leadership/ Influence	Obtains confidence of others	
			Critical Thinking	Cognitive activities	Identifies critical issues; draws conclusions; develops an action plan
31	Complete Module 2 review, A.S. 7		Reading	Reading comprehension	Demonstrates knowledge of anatomy and physiology
				Functional reading	Follows written directions
			Science	Life science	Identifies/classifies living organisms; applies knowledge of biochemistry and microbiology

Basic Skills Matrix

Module 3: Infection, Immunology, and Sanitation

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
13	Complete the crossword puzzle of terms (Obj. 1-4), A.S. 1		Reading	Reading comprehension	Applies what has been read to specific task
				Functional reading	Follows written directions; uses content area vocabulary
14	Complete the crossword puzzle of terms (Obj. 5-12), A.S. 2		Science	Life science	Applies knowledge of terms related to infection, immunology, and sanitation as they relate to the human body
				Reading	Applies what has been read to specific task
15	Conduct a sanitation inspection of the salon/laboratory and classroom, A.S. 3		Writing	Language	States ideas clearly
				Composition	Composes report
15	Conduct a sanitation inspection of the salon/laboratory and classroom, A.S. 3		Science	Research	Takes notes
				General science	Collects specimens; uses scientific instruments; reports findings
15	Conduct a sanitation inspection of the salon/laboratory and classroom, A.S. 3		Oral Communication	Life science	Identifies/classifies organisms; investigates health issues
				Oral presentation	Makes informative presentations; selects/uses words effectively
15	Conduct a sanitation inspection of the salon/laboratory and classroom, A.S. 3		Writing	Listening	Applies active listening skills; draws conclusions
				Interactive communication	Works effectively in a group; communicates effectively with peers
15	Conduct a sanitation inspection of the salon/laboratory and classroom, A.S. 3		Interspersonal	Teamwork	Gives/receives feedback; works with group to achieve goals
				General relating	Participates in group activity
15	Conduct a sanitation inspection of the salon/laboratory and classroom, A.S. 3		Critical Thinking	Cognitive activities	Collects/records information; evaluates results
				Employability	Inspects equipment and facilities; checks for cleanliness and sanitary conditions
15	Conduct a sanitation inspection of the salon/laboratory and classroom, A.S. 3		Employability	Job safety	Inspects equipment and facilities; checks for cleanliness and sanitary conditions

Basic Skills Matrix

Module 3: Infection, Immunology, and Sanitation (cont.)

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
16	Analyze cosmetology scenarios, A.S. 4		Reading	Reading comprehension	Acquires and analyzes information/ data; draws conclusions
				Functional reading	Follows written directions
			Writing	Language	States ideas clearly
			Science	Life science	Investigates health issues; applies principles of infection, immunology, and sanitation as they relate to the human body
			Interpersonal	General relating	Interacts with clients; identifies personal values or attitudes
				Leadership/ influence	Obtains confidence of others
			Critical Thinking	Cognitive activities	Identifies critical issues; draws conclusions; develops an action plan
17	Complete Module 3 review, A.S. 5		Reading	Reading comprehension	Demonstrates knowledge of anatomy and physiology
				Functional reading	Follows written directions
			Science	Life science	Identifies/classifies living organisms; applies knowledge of infection, immunology, and sanitation as they relate to the human body

Basic Skills Matrix

Module 4: Tissues

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
11	Complete the crossword puzzle of terms (Obj. 1-10), A.S. 1		Reading	Reading comprehension	Applies what has been read to specific task
				Functional reading	Follows written directions; uses content area vocabulary
12	Develop a presentation on basic tissue of the human body, A.S. 2		Science	Life science	Applies knowledge of terms related to anatomy and physiology
					Reading
		Research/reference	Selects/locates resources		
			Writing		
				Composition	Composes presentation
		Research	Takes notes		
		Functional writing	Uses computer software to prepare presentation		
			Science	Life science	Identifies basic tissue of the human body; applies principles of anatomy and physiology
					Oral Communication
		Interactive communication	Works effectively in a group; communicates effectively with peers		
Listening	Applies active listening skills; draws conclusions				
	Interpersonal	Teamwork	Gives/receives feedback; works with group to achieve goals		
		General relating	Participates in group activity		
13	Complete Module 4 review, A.S. 3		Reading	Reading comprehension	Demonstrates knowledge of anatomy and physiology
				Functional reading	Follows written directions
			Science	Life science	Applies knowledge of anatomy and physiology related to tissues

Basic Skills Matrix

Module 5: Integumentary System

Academic and Workplace Skills						
Obj. #	Objective	Icon	Skill	Sub Skill	Description	
18	Complete the crossword puzzle of terms (Obj. 1-7), A.S. 1		Reading	Reading comprehension	Applies what has been read to specific task	
				Functional reading	Follows written directions; uses content area vocabulary	
19	Complete the crossword puzzle of terms (Obj. 8-14), A.S. 2		Science	Life science	Applies knowledge of terms related to anatomy and physiology	
				Reading	Applies what has been read to specific task	
20	Complete the crossword puzzle of terms (Obj. 15-16), A.S. 3		Reading	Reading comprehension	Applies what has been read to specific task	
				Functional reading	Follows written directions; uses content area vocabulary	
21	Complete the crossword puzzle of terms (Obj. 17), A.S. 4		Science	Life science	Applies knowledge of terms related to anatomy and physiology	
				Reading	Applies what has been read to specific task	
22	Create a graphic organizer, A.S. 5		Reading	Reading comprehension	Gains factual information	
				Research/reference	Selects/locates related Internet resources	
22	Create a graphic organizer, A.S. 5		Reading	Functional reading	Follows written directions	
				Writing	Language	States ideas clearly
				Composition	Uses complete sentences; composes report; proofreads paper	
				Research	Constructs graphic organizer to outline content	
22	Create a graphic organizer, A.S. 5		Writing	Functional writing	Writes paper; uses word processing software	
				Research	Constructs graphic organizer to outline content	

Basic Skills Matrix

Module 5: Integumentary System (cont.)

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
23	Review the structures, layers, and glands of the skin, A.S. 6		Science	Life science	Investigates/applies principles of anatomy and physiology
			Interpersonal	Teamwork	Gives/receives feedback
			Critical Thinking	Cognitive activities	Collects/records information; identifies critical elements; analyzes/synthesizes information; draws conclusions
			Technology	Application	Demonstrates ability to use computer, the Internet, and software to research subject matter and develop written paper
			Reading	Functional reading	Follows written directions
			Science	Life science	Applies principles of anatomy and physiology
24	Analyze cosmetology scenarios, A.S. 7		Oral Communication	Oral presentation	Selects/uses words effectively
				Listening	Applies active listening skills
			Interpersonal	General relating	Participates in group activities
				Teamwork	Applies appropriate behavior
			Reading	Reading comprehension	Acquires and analyzes information/data; draws conclusions
				Functional reading	Follows written directions
			Writing	Language	States ideas clearly
			Science	Life science	Investigates health issues; applies principles of anatomy and physiology
			Interpersonal	General relating	Interacts with clients; identifies personal values or attitudes
				Leadership/Influence	Obtains confidence of others
		Critical Thinking	Cognitive activities	Identifies critical issues; draws conclusions; develops an action plan	

Basic Skills Matrix

Module 5: Integumentary System (cont.)

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
25	Complete Module 5 review, A.S. 8		Reading	Reading comprehension	Demonstrates knowledge of anatomy and physiology
			Science	Life science	Follows written directions Applies knowledge of anatomy and physiology related to the integumentary system

Basic Skills Matrix

Module 6: Skeletal System

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
14	Complete the crossword puzzle of terms (Obj. 1-6), A.S. 1		Reading	Reading comprehension	Applies what has been read to specific task
				Functional reading	Follows written directions; uses content area vocabulary
15	Complete the crossword puzzle of terms (Obj. 7-13), A.S. 2		Science	Life science	Applies knowledge of terms related to anatomy and physiology
15	Complete the crossword puzzle of terms (Obj. 7-13), A.S. 2		Reading	Reading comprehension	Applies what has been read to specific task
				Functional reading	Follows written directions; uses content area vocabulary
16	Locate and identify bones of the cranium, A.S. 3		Science	Life science	Applies knowledge of terms related to anatomy and physiology
16	Locate and identify bones of the cranium, A.S. 3		Writing	Functional	Constructs word keys
16	Locate and identify bones of the cranium, A.S. 3		Science	Life science	Applies knowledge of terms related to anatomy and physiology
16	Locate and identify bones of the cranium, A.S. 3		Oral Communication	Listening	Applies active listening skills
				Interactive communication	Communicates with co-worker
16	Locate and identify bones of the cranium, A.S. 3		Interpersonal	General relating	Interacts with co-worker
				Teamwork	Gives/receives feedback
16	Locate and identify bones of the cranium, A.S. 3		Employability	Job development	Masters specific task; applies good work habits
17	Locate and identify bones of the face, A.S. 4		Writing	Functional	Constructs word keys
17	Locate and identify bones of the face, A.S. 4		Science	Life science	Applies knowledge of terms related to anatomy and physiology
17	Locate and identify bones of the face, A.S. 4		Oral Communication	Listening	Applies active listening skills
				Interactive communication	Communicates with co-worker
17	Locate and identify bones of the face, A.S. 4		Interpersonal	General relating	Interacts with co-worker
				Teamwork	Gives/receives feedback
17	Locate and identify bones of the face, A.S. 4		Employability	Job development	Masters specific task; applies good work habits

Basic Skills Matrix

Module 6: Skeletal System (cont.)

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
18	Analyze cosmetology scenarios, A.S. 5		Reading	Reading comprehension	Acquires and analyzes information/ data; draws conclusions
				Functional reading	Follows written directions
			Writing	Language	States ideas clearly
			Science	Life science	Investigates health issues; applies principles of anatomy and physiology
			Interpersonal	General relating	Interacts with clients; identifies personal values or attitudes
			Leadership/ Influence	Obtains confidence of others	
			Critical Thinking	Cognitive activities	Identifies critical issues; draws conclusions; develops an action plan
19	Complete Module 6 review, A.S. 6		Reading	Reading comprehension	Demonstrates knowledge of anatomy and physiology
				Functional reading	Follows written directions
			Science	Life science	Applies knowledge of anatomy and physiology related to the skeletal system

Basic Skills Matrix

Module 7: Muscular System

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
19	Complete the crossword puzzle of terms (Obj. 1-8), A.S. 1		Reading	Reading comprehension	Applies what has been read to specific task
				Functional reading	Follows written directions; uses content area vocabulary
20	Complete the crossword puzzle of terms (Obj. 9), A.S. 2		Science	Life science	Applies knowledge of terms related to anatomy and physiology
				Reading	Applies what has been read to specific task
21	Complete the crossword puzzle of terms (Obj. 10-12), A.S. 3		Reading	Reading comprehension	Applies what has been read to specific task
				Functional reading	Follows written directions; uses content area vocabulary
22	Locate and identify major muscles of the head, face, and neck, A.S. 4		Science	Life science	Applies knowledge of terms related to anatomy and physiology
				Writing	Constructs word keys
			Oral Communication	Listening	Applies active listening skills
				Interactive communication	Communicates with co-worker
			Interpersonal	General relating	Interacts with co-worker
				Teamwork	Gives/receives feedback
			Employability	Job development	Masters specific task; applies good work habits

Basic Skills Matrix

Module 7: Muscular System (cont.)

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
23	Complete the crossword puzzle of terms (Obj. 13-16), A.S. 5		Reading	Reading comprehension	Applies what has been read to specific task
			Science	Life science	Follows written directions; uses content area vocabulary
24	Complete the crossword puzzle of terms (Obj. 17-18), A.S. 6		Reading	Reading comprehension	Applies what has been read to specific task
			Science	Life science	Follows written directions; uses content area vocabulary
25	Analyze cosmetology scenarios, A.S. 7		Reading	Reading comprehension	Applies knowledge of terms related to anatomy and physiology
			Reading	Functional reading	Acquires and analyzes information/ data; draws conclusions
			Writing	Language	Follows written directions
			Science	Life science	States ideas clearly
			Interpersonal	General relating	Investigates health issues; applies principles of anatomy and physiology
			Interpersonal	Leadership/ Influence	Interacts with clients; identifies personal values or attitudes
26	Complete Module 7 review, A.S. 8		Critical Thinking	Cognitive activities	Obtains confidence of others
			Reading	Reading comprehension	Identifies critical issues; draws conclusions; develops an action plan
			Reading	Functional reading	Demonstrates knowledge of anatomy and physiology
			Science	Life science	Follows written directions
					Applies knowledge of anatomy and physiology related to the muscular system

Basic Skills Matrix

Module 8: Nervous System

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
15	Complete the crossword puzzle of terms (Obj. 1-5), A.S. 1		Reading	Reading comprehension	Applies what has been read to specific task
				Functional reading	Follows written directions; uses content area vocabulary
16	Complete the crossword puzzle of terms (Obj. 6-13), A.S. 2		Science	Life science	Applies knowledge of terms related to anatomy and physiology
				Reading	Reading comprehension
17	Complete the crossword puzzle of terms (Obj. 14), A.S. 3		Reading	Functional reading	Follows written directions; uses content area vocabulary
				Science	Life science
18	Participate in a "Face Off", A.S. 4		Writing	Reading comprehension	Applies what has been read to specific task
				Functional reading	Follows written directions; uses content area vocabulary
			Science	Life science	Applies knowledge of terms related to anatomy and physiology
				Oral Communication	Listening
			Interpersonal	Interactive communication	Communicates with co-workers; follows oral directions; works effectively in a group
General relating	Participates in group activities				
	Teamwork	Gives/receives feedback; builds consensus			
Leadership	Obtains confidence of others; persuades others				

Basic Skills Matrix

Module 8: Nervous System (cont.)

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
19	Analyze cosmetology scenarios, A.S. 5		Reading	Reading comprehension	Acquires and analyzes information/ data; draws conclusions
				Functional reading	Follows written directions
			Writing	Language	States ideas clearly
			Science	Life science	Investigates health issues; applies principles of anatomy and physiology
			Interpersonal	General relating	Interacts with clients; identifies personal values or attitudes
			Leadership/ Influence	Obtains confidence of others	
			Critical Thinking	Cognitive activities	Identifies critical issues; draws conclusions; develops an action plan
20	Complete Module 8 review, A.S. 6		Reading	Reading comprehension	Demonstrates knowledge of anatomy and physiology
				Functional reading	Follows written directions
			Science	Life science	Applies knowledge of anatomy and physiology related to the nervous system

Basic Skills Matrix

Module 9: Circulatory System

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
25	Complete the crossword puzzle of terms (Obj. 1-7), A.S. 1		Reading	Reading comprehension	Applies what has been read to specific task
				Functional reading	Follows written directions; uses content area vocabulary
26	Complete the crossword puzzle of terms (Obj. 8-24), A.S. 2		Science	Life science	Applies knowledge of terms related to anatomy and physiology
				Reading	Applies what has been read to specific task
26	Complete the crossword puzzle of terms (Obj. 8-24), A.S. 2		Reading	Reading comprehension	Applies what has been read to specific task
				Functional reading	Follows written directions; uses content area vocabulary
26	Complete the crossword puzzle of terms (Obj. 8-24), A.S. 2		Science	Life science	Applies knowledge of terms related to anatomy and physiology
				Reading	Applies what has been read to specific task
27	Construct a model of the human heart, A.S. 3		Reading	Research/Reference	Locates related Internet resources to compile data
				Reading comprehension	Interacts with text to form a personal interpretation
				Functional reading	Follows written directions
			Writing	Research	Takes notes; describes appropriate details
				Mathematics	Determines accurate proportion for model and estimates area of irregular-shaped object
			Science	Life science	Investigates size, shape and structure of heart; constructs life size model of heart; infers function of heart and gives structural description
				Oral Communication	Makes informative presentation; integrates visual resource into oral presentation; uses effective body language
			Oral Communication	Oral presentation	Makes informative presentation; integrates visual resource into oral presentation; uses effective body language
				Interactive communication	Works effectively in a group; communicates effectively with peers
			Interpersonal	Listening	Applies active listening skills; draws conclusions
Teamwork	Gives/receives feedback; works with group to achieve goals				
General relating	Participates in group activity				

Basic Skills Matrix

Module 9: Circulatory System (cont.)

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
28	Research the route of a blood cell through the circulatory system, A.S. 4		Technology	Application	Demonstrates ability to use computer, the Internet, and software to research subject matter
			Reading	Reading comprehension	Gains factual information
				Research/reference	Selects/locates related Internet resources
				Functional reading	Follows written directions
			Writing	Language	States ideas clearly
				Composition	Uses complete sentences; composes report; proofreads paper
				Research	Constructs graphic organizer to outline content
				Functional writing	Writes paper; uses word processing software
	Science	Life science	Investigates/applies principles of anatomy and physiology		
	Critical Thinking	Cognitive activities	Collects/records information; identifies critical elements; analyzes/synthesizes information; draws conclusions; creates an original paper		
29	Analyze cosmetology scenarios, A.S. 5		Technology	Application	Demonstrates ability to use computer, the Internet, and software to research subject matter and develop written paper
			Reading	Reading comprehension	Acquires and analyzes information/ data; draws conclusions
				Functional reading	Follows written directions
			Writing	Language	States ideas clearly
					Science

Basic Skills Matrix

Module 9: Circulatory System (cont.)

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
30	Complete Module 9 review, A.S. 6		Interpersonal	General relating	Interacts with clients; identifies personal values or attitudes
				Leadership/ Influence	Obtains confidence of others
			Critical Thinking	Cognitive activities	Identifies critical issues; draws conclusions; develops an action plan
			Reading	Reading comprehension	Demonstrates knowledge of anatomy and physiology
			Functional reading	Follows written directions	
			Science	Life science	Applies knowledge of anatomy and physiology related to the circulatory system

Basic Skills Matrix

Module 10: Respiratory, Digestive, and Urinary Systems

Academic and Workplace Skills							
Obj. #	Objective	Icon	Skill	Sub Skill	Description		
12	Complete the crossword puzzle of terms (Obj. 1-11), A.S. 1		Reading	Reading comprehension	Applies what has been read to specific task		
				Functional reading	Follows written directions; uses content area vocabulary		
13	Participate in a "Face Off", A.S. 2		Science	Life science	Applies knowledge of terms related to anatomy and physiology		
				Writing	Language	States ideas clearly	
					Functional writing	Writes responses	
				Science	Life science	Applies principles of anatomy and physiology related to respiratory, digestive, and urinary systems	
					Oral Communication	Listening	Applies active listening skills
Interpersonal		General relating	Participates in group activities				
			Teamwork	Gives/receives feedback; builds consensus			
			Leadership	Obtains confidence of others; persuades others			
14	Analyze cosmetology scenarios, A.S. 3		Reading	Reading comprehension	Acquires and analyzes information/ data; draws conclusions		
				Functional reading	Follows written directions		
				Writing	Language	States ideas clearly	
					Science	Life science	Investigates health issues; applies principles of anatomy and physiology
				Interpersonal		General relating	Interacts with clients; identifies personal values or attitudes
							Leadership/ Influence
Critical Thinking		Cognitive activities	Identifies critical issues; draws conclusions; develops an action plan				

Basic Skills Matrix

Module 10: Respiratory, Digestive, and Urinary Systems (cont.)

Academic and Workplace Skills					
Obj. #	Objective	Icon	Skill	Sub Skill	Description
15	Complete Module 10 review, A.S. 4		Reading	Reading comprehension	Demonstrates knowledge of anatomy and physiology
				Functional reading	Follows written directions
			Science	Life science	Applies knowledge of anatomy and physiology related to respiratory, digestive, and urinary systems
			Interpersonal	General relating	Interacts with clients; identifies personal values or attitudes
			Leadership/Influence	Obtains confidence of others	
			Critical Thinking	Cognitive activities	Identifies critical issues; draws conclusions; develops an action plan

A Cosmetologist's Introduction to Anatomy and Physiology

Tools, Equipment, and Materials List

Following is an alphabetical list of tools, equipment, and materials that are recommended for completion of assignment sheets included in the student workbook.

3-D modeling computer program (optional)
Chair, adjustable
Clay, modeling
Comb
Computer (classroom or resource center)
Conditioner
Construction paper
Cotton swabs
Flip chart (optional)
Glue
Hair brush
Hair clips
Hand sanitizer
Head rest cover
Internet service (classroom or resource center)
Marking pens (optional)
Microscope (access to science lab)
Neck strip
Petri dishes (access to science lab)
PowerPoint® software (optional)
Printer (classroom or resource center)
Scissors
Shampoo
Shampoo cape
Towels
Wash basin
Water
Microsoft Word® or wordprocessing software (classroom or resource center)

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Suggestions

- Product Needs (supplemental resources, additional publications, etc.)

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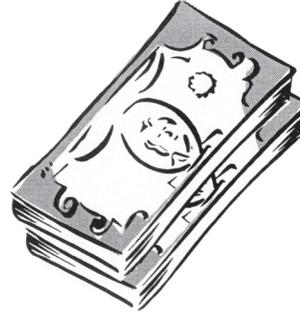
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Module Contents

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2—Construct a Model of an Organ of the Human Body	3
3—Analyze a Cosmetology Scenario.	5
4—Complete Module 1 Review	7

* Assignment Sheets are located in the Student Workbook.

Instructional Plan

Suggested Activities

Preparation

- Read the module carefully and plan for instruction.
- Review “Teaching Suggestions.” Plan for classroom activities.
- Plan your presentation to take advantage of student learning styles and to accommodate special-needs students.
- Prepare classroom. Put up posters and charts and display articles and other references related to this module.
- Obtain resources to supplement instruction of this module. See “Resources Used in Developing This Module” and “Suggested Supplemental Resources.”
- Review the “Suggested Web Sites,” and make a list of additional sites you may have found for students to research to learn more about the human body.
- For self-paced instruction, review Learning Activities Sheet. Go to “customizable files” link on teacher edition CD and modify as appropriate to include additional activities and/or resources available in your classroom. Make one copy for each student.
- Make copies of any teacher supplements that will be provided for each student.
- Make transparencies from the transparency masters included in this module. These appear in teacher edition only. A PowerPoint® presentation of transparencies is located on the teacher edition CD.

Delivery and Application

Module Introduction (self-paced instruction)

- Refer student to Learning Activities Sheet and module of instruction located in student guide.
- Review module contents with student.
- Have the student complete the steps in the Learning Activities Sheet.

Module Introduction (group instruction)

- Provide students with module of instruction.

Suggested Activities

- Discuss module and specific objectives.
- Discuss the information sheet. Implement teaching plan to localize, supplement, and personalize the module. Reinforce basic academic and workplace skills when applicable.
- Discuss Student Supplement 1—Accessory Structures of the Eye, and explain the importance of protecting the eye when coloring eyebrows, waxing and shaping eyebrows, and applying eye makeup.
- Discuss the assignment sheets. Review with students the criteria for evaluation of these activities.

Teaching Suggestions

- ✓ **Note:** This module has two primary purposes: to introduce students to the organization of the human body and to begin to build the students' anatomy and physiology vocabularies. Look for opportunities to reinforce both goals as you present the module.
- Select one of the classroom literacy activities provided in Teacher Supplement 1 in this module. Use with students to help them improve their literacy skills (reading, writing, speaking, listening, and thinking) and to learn new subject matter.
- Use crossword puzzle (Assignment Sheet 1) to help reinforce the terms in the associated objectives.
- For Assignment Sheet 2, obtain materials for students to use in constructing their models of various body organs. Assign two students to work together to build model and make presentation to class.
- Use module review (Assignment Sheet 4) to assess student knowledge of major body structures and organ systems.

Evaluation

- Make copies of the written test. Using the Word® file included on the teacher edition CD, add or modify test items as needed. The written test serves as both a pretest and posttest to assist in measuring each student's competency gains.
- Give and evaluate pretest. Modify lesson plan to include additional instruction for those areas where students were deficient.
- Evaluate the assignment sheets. Rate the student using the criteria listed on each assignment sheet. See Answers to Assignment Sheets for correct answers where applicable. If the student's performance is unacceptable, have the student review the appropriate materials and complete the assignment again.

Suggested Activities

Resources Used in Developing This Module

- Give and evaluate the posttest.
- Meet individually with students to evaluate their progress through this module of instruction and indicate to them possible areas for improvement.
- Reteach and retest as required.

Print Media

- *Anatomy and Physiology*. Stillwater, OK: Multistate Academic and Vocational Curriculum Consortium, Inc., 2002.
- Gray, Henry. *Gray's Anatomy*, 39th ed. New York: Mosby, 2004.
- Gylys, Barbara A., and Regina Masters. *Medical Terminology Simplified*, 3rd ed. Philadelphia: F.A. Davis Company, 2005.
- Scanlon, Valerie C. and Tina Sanders. *Essentials of Anatomy and Physiology*, 4th ed. Philadelphia: F.A. Davis Company, 2002.
- Thibodeau, Gary A., and Kevin T. Patton. *Anatomy and Physiology*, 5th ed. St. Louis: Mosby, 2002.

Suggested Supplemental Resources

Print Media

- *Basic Operator*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2006.
- *Basic Esthetician*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.
- *Basic Manicurist*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.
- Forget, Mark A. *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Victoria, British Columbia; Trafford Publishing, 2004.

Suggested Activities

Suggested Web Sites

✓ **Note:** The following web sites offer general information about anatomy and physiology and generally cover more than one body system.

- opencourse.org/collaboratories/harveyproject

The Harvey Project is an international collaboration of educators, researchers, physicians, students, programmers, instructional designers, and graphic artists working together to build interactive, dynamic human physiology course materials on the World Wide Web. Materials produced by the Harvey Project are available free to educational institutions. The site is constantly updated and should be checked often and browsed for overall content. The address provided is for the home page. By clicking the WEB button, you will be taken to an index of links divided into categories such as general physiology and specific systems. The number of links in each category is indicated in parentheses after the topic.

- <http://www.innerbody.com/htm/body.html>

This site provides a great deal of information on the human body in fun, interactive formats. There is a great deal of emphasis on terminology and body parts.

- <http://www.ama-assn.org/ama/pub/category/7140.html>

This site provides a wealth of information and many useful graphics about human anatomy.

- <http://en.wikipedia.org/wiki/integumentarysystem>

This site provides great information on the various body systems that make up the human body. To move from one body system to another, simply change the system name in the Web address. For example, change "integumentary" to "muscular" to go to the section of this on-line encyclopedia that addresses that system.

- <http://dir.yahoo.com/science/biology/anatomy>

By going to this site, you will have access to a variety of Web addresses that cover the body systems in the human anatomy. Click on the body system you wish to explore to access Web sites that offer good information as well as illustrations to further explore the human body.

- ✓ **Note:** Web-site addresses were accurate and all content on referenced web sites was appropriate during development and production of this product. However, web sites sometimes change; MAVCC takes no responsibility for a site's content. The inclusion of a web site does not constitute an endorsement of that site's other pages, products, or owners. You are encouraged to verify all web sites prior to use.

Answers to Assignment Sheets

Assignment
Sheet 4

Complete Module 1 Review

- | | | | |
|-----|---|-----|---|
| 1. | c | 11. | a |
| 2. | d | 12. | c |
| 3. | a | 13. | c |
| 4. | a | 14. | b |
| 5. | d | 15. | a |
| 6. | d | 16. | d |
| 7. | b | 17. | d |
| 8. | a | 18. | b |
| 9. | b | 19. | a |
| 10. | b | 20. | d |

Written Test

Name _____

Date _____ Score _____

Objective 1

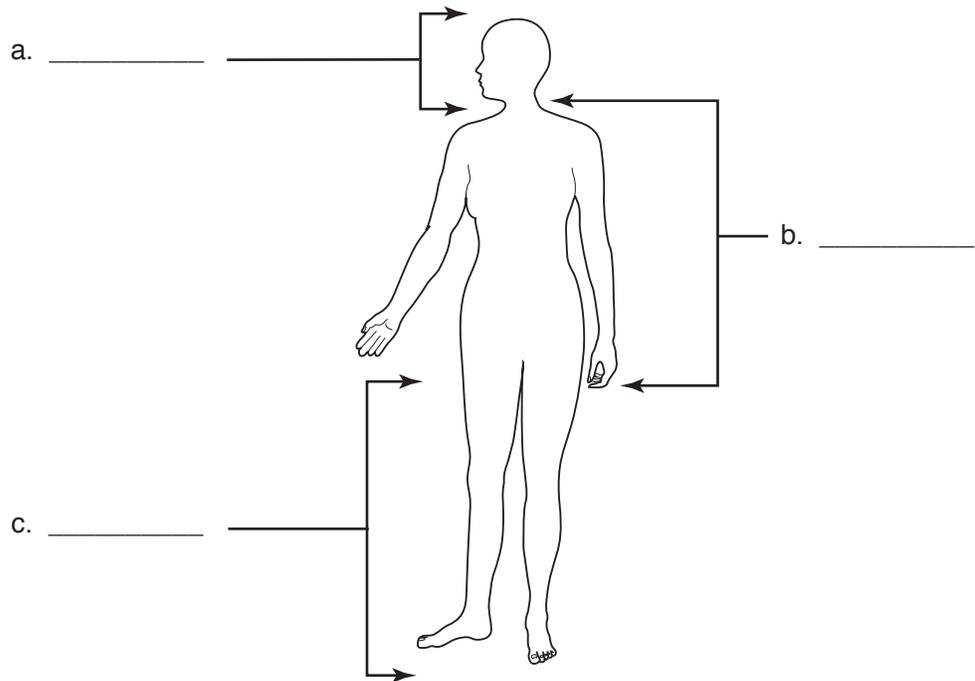
Define the terms anatomy and physiology. Write your answers on the blank lines provided beside each of the terms below.

a. Anatomy _____

b. Physiology _____

Objective 2

Label the general regions of the body. Write your answers on the blank lines provided beside the illustration below.



Written Test

Objective 3

Arrange the major body structures in order of increasing complexity. Number from 1 to 5 with 1 being the least and 5 being the most complex. Write your answers on the blank lines provided.

- _____ a. Organ system
- _____ b. Tissue
- _____ c. Organ
- _____ d. Organism
- _____ e. Cell

Objective 4

Match the major organ systems with their functions. Write the numbers on the blanks provided. Definitions continue on the next page.

- | | |
|-------------------------|------------------------|
| 1. Circulatory system | 7. Nervous system |
| 2. Digestive system | 8. Reproductive system |
| 3. Endocrine system | 9. Respiratory system |
| 4. Immune system | 10. Skeletal system |
| 5. Integumentary system | 11. Special senses |
| 6. Muscular system | 12. Urinary system |

- _____ a. Receives, breaks down, and absorbs food substances and excretes waste products
- _____ b. Serves in removing waste products from the blood and in excreting wastes in the form of urine
- _____ c. Provides protection against disease and infection
- _____ d. Provides the framework for the body and works to protect and support the body
- _____ e. Provides for body movement and support
- _____ f. Involved with reproduction and childbirth
- _____ g. Protects the organism from injury, disease, and infection; aids in the regulation of temperature, the excretion of wastes, and the reception of sensations
- _____ h. Takes in oxygen from the air and gives off carbon dioxide, which is produced by cell metabolism
- _____ i. Serves to regulate various body functions through glands that secrete hormones directly into the blood to slow down or increase the activity of the cells

Objective 5

- _____ j. Coordinates body activities by receiving, interpreting, and conducting messages to all the other systems of the body
- _____ k. Transports materials throughout the body by carrying oxygen and nutrients in the blood to all the cells of the body and carrying away the waste products of the cells
- _____ l. Function in receiving sensations such as sight, smell, hearing, and taste

Match the major organs and structures in each of the major organ systems with their descriptions. Write the numbers on the blanks provided.

- | | |
|-------------------------|-------------------------|
| 1. Integumentary system | 7. Circulatory system |
| 2. Skeletal system | 8. Respiratory system |
| 3. Muscular system | 9. Urinary system |
| 4. Nervous system | 10. Reproductive system |
| 5. Special senses | 11. Endocrine system |
| 6. Digestive system | 12. Immune system |

- _____ a. Brain, spinal cord, peripheral nerves
- _____ b. Ductless glands
- _____ c. Bones, joints, cartilage, connective tissue
- _____ d. Lungs, nose, pharynx, larynx
- _____ e. Skin, hair, nails, duct glands
- _____ f. White blood cells, antibodies
- _____ g. Heart, blood vessels, blood, lymphatic tissues
- _____ h. Skeletal, smooth, and cardiac muscles
- _____ i. Eyes, ears, nose, taste buds
- _____ j. Kidneys, ureter, bladder, urethra
- _____ k. Mouth, pharynx, esophagus, stomach, large and small intestines, and accessory organs
- _____ l. Sex organs and ducts to the outside

Written Test

Objective 6

Select from the following list primary physiological characteristics of the body that are affected by the hormones of the endocrine system. Place an "X" on the blank next to the correct characteristics.

- _____ a. Rate of metabolism
- _____ b. Growth and development processes
- _____ c. Appetite and food intake
- _____ d. Development of higher mental functions
- _____ e. Ability of body to meet conditions of stress
- _____ f. Development and functioning of the digestive organs
- _____ g. Resistance to disease
- _____ h. Secretion of other hormones

***Permission to duplicate this test is granted.**

Answers to Written Test

- | | | | | | | | | | | | | | |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-------|------|------|------|-------|------|------|------|-------|-------|
| Objective 1 | <ul style="list-style-type: none"> a. Anatomy—The scientific study of the structure of an organism that describes the size, shape, construction, and relative positions of the organs in the body b. Physiology—The scientific study of the functions of an organism that describes how the organs work independently and in relation to the whole organism | | | | | | | | | | | | |
| Objective 2 | <ul style="list-style-type: none"> a. Head b. Trunk c. Lower limbs | | | | | | | | | | | | |
| Objective 3 | <ul style="list-style-type: none"> a. 4 b. 2 c. 3 d. 5 e. 1 | | | | | | | | | | | | |
| Objective 4 | <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">a. 2</td> <td style="width: 50%;">g. 5</td> </tr> <tr> <td>b. 12</td> <td>h. 9</td> </tr> <tr> <td>c. 4</td> <td>i. 3</td> </tr> <tr> <td>d. 10</td> <td>j. 7</td> </tr> <tr> <td>e. 6</td> <td>k. 1</td> </tr> <tr> <td>f. 8</td> <td>l. 11</td> </tr> </table> | a. 2 | g. 5 | b. 12 | h. 9 | c. 4 | i. 3 | d. 10 | j. 7 | e. 6 | k. 1 | f. 8 | l. 11 |
| a. 2 | g. 5 | | | | | | | | | | | | |
| b. 12 | h. 9 | | | | | | | | | | | | |
| c. 4 | i. 3 | | | | | | | | | | | | |
| d. 10 | j. 7 | | | | | | | | | | | | |
| e. 6 | k. 1 | | | | | | | | | | | | |
| f. 8 | l. 11 | | | | | | | | | | | | |
| Objective 5 | <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">a. 4</td> <td style="width: 50%;">g. 7</td> </tr> <tr> <td>b. 11</td> <td>h. 3</td> </tr> <tr> <td>c. 2</td> <td>i. 5</td> </tr> <tr> <td>d. 8</td> <td>j. 9</td> </tr> <tr> <td>e. 1</td> <td>k. 6</td> </tr> <tr> <td>f. 12</td> <td>l. 10</td> </tr> </table> | a. 4 | g. 7 | b. 11 | h. 3 | c. 2 | i. 5 | d. 8 | j. 9 | e. 1 | k. 6 | f. 12 | l. 10 |
| a. 4 | g. 7 | | | | | | | | | | | | |
| b. 11 | h. 3 | | | | | | | | | | | | |
| c. 2 | i. 5 | | | | | | | | | | | | |
| d. 8 | j. 9 | | | | | | | | | | | | |
| e. 1 | k. 6 | | | | | | | | | | | | |
| f. 12 | l. 10 | | | | | | | | | | | | |
| Objective 6 | a, b, d, e, g, h | | | | | | | | | | | | |

Introduction

Teacher Supplement 1 – Classroom Literacy Activities

Classroom literacy activities have been provided in Module 1 to encourage their integration into this and subsequent modules as part of the lesson plan. Preparation time is minimal, if any, for the teacher to use in helping students improve their reading, writing, speaking, listening, and thinking skills. These activities are also suitable for a substitute teacher to use to engage students in learning and keep them focused when the regular teacher is away.

The following activities may be used in virtually all subject areas and have been adapted from *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*, written by Mark A. Forget, Ph.D., ©2004. Dr. Forget is president and director of staff development for MAX Teaching, Inc., and conducts workshops around the United States to share literacy techniques with educators to improve students' literacy skills.

Classroom Literacy Activities

- Focused Free Writes
- Write What I Know & Read
- 3-2-1
- Stump the Teacher: Stump the Student
- Directed Reading—Thinking: What I Know Sheet

The “*Question Mark*” located in *Stump the Teacher: Stump the Student* is a great tool for students and may be reproduced on card stock and laminated for use as a bookmark for students to keep and use in literacy activities. The “*What I Know Sheet*” provided in the *Directed Reading—Thinking* activity may also be reproduced for student use.

Periodic reminders to include one or more of these activities to introduce new information or concepts may be found in the “Teaching Suggestions” segment of the Suggested Activities component included in each teacher module.

Anticipation Guides have been included as “Teacher Supplements” in Modules 4, 5, 8, 9, and 10 to further integrate meaningful activities that reinforce learning of new subject matter and the development of literacy skills.

Classroom Literacy Activity

Focused Free Writes

Preparation Time:

0 minutes for the teacher

Time to Complete:

30 seconds to 4 + or – minutes

Purpose:

Review of subject matter to encourage the student to realize what they know about a subject from prior knowledge gained from other classes, movies, the Internet, and personal experiences. This activity keeps all students engaged in learning and makes the teacher aware of what the student has learned and what the student has questions about, and provides input for opening class discussion the next class meeting.

Directions Part 1

Students take out a clean piece of paper and at the appointed time and begin to write what they know about the subject. The key is that the student cannot stop writing until the teacher calls time. The student must continue to write. If they cannot think of new statements or information to write, they simply repeat the last statement they wrote until a new thought comes to their mind.

✓ **Note:** Students, who do not generally write freely, will need to start with the time of 30 seconds and build up to 4 minutes.

Directions Part 2

Collect the *Focus Free Writes* and scan them for understanding, misunderstandings, or concepts missed by the majority of the class. This activity should **not** be graded. It should, however, teach the student the value of reflecting in writing, thus enabling the student to slow down and synthesize the various components of the lesson.

Adapted from *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Mark A. Forget, Ph.D., ©2004.

Classroom Literacy Activity

Write What I Know and Read

Preparation Time:

0 minutes for the teacher

Time to Complete:

3 to 5 + or – minutes

Purpose:

Review of subject matter to encourage the student to realize what they know about a subject from prior knowledge gained from other classes, movies, the Internet, and personal experiences. This activity allows students to learn from each other and keeps all students engaged in learning. It also gives the student the opportunity to build on their peer's knowledge and realize what they have learned.

Directions Part 1

Students are seated in groups of 3 to 5. Students take out a clean piece of paper and at the appointed time begin to write what they know about the subject, or they could be directed to write concerning a client with a particular problem that you might see in the salon. The key is that the student thinks and writes. Once time is called the students pass their papers to other students in their group. A certain amount of time is given for students to read what their peer wrote. Then students are given a certain amount of time to add information to what the peer wrote about the subject. Once the time is called the students pass their papers to another student and the process is continued until all students in the group have the opportunity to read their peers thoughts and write additional information. Students must continue to write and contribute to the information. If they cannot think of new statements or information to write, they simply repeat the last statement that was written until a new thought comes to their mind. Students should keep writing, keep thinking, and keep expanding the information on the paper.

✓ **Note:** Students, who do not generally write freely, will need to start with the time of 10 seconds and build up to a longer period of time.

Directions Part 2

Collect the *Write What I Know and Read* papers and scan them for understanding, misunderstandings, or concepts missed by the majority of the class. This activity should **not** be graded. It should, however, teach the student the value of reflecting in writing and enabling the student the value of teamwork, respect, and building on the knowledge of others.

Adapted from *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Mark A. Forget, Ph.D., ©2004.

Classroom Literacy Activity

3-2-1

Preparation Time:

0 minutes for the teacher

Time to Complete:

1 to 4 + or – minutes

Purpose:

Review of subject matter, teaching bell to bell to keep all students engaged in learning. This activity makes the teacher aware of what the student has learned and what the student has questions about, and provides ideas for opening class discussion at the beginning of the next class meeting.

Directions Part 1

Students take out a piece of clean paper and draw two lines on the paper dividing the paper into three equal parts. On the first section on the left at the top, write “3 Things I Learned Today”. In the middle section, write “2 Things I Was Surprised to Learn”. In the last section, write “1 Thing I Am Not Clear On or I Have a Question About”.

Example:

3	2	1
Things I Learned Today	Things I Was Surprised to Learn	Thing I Have a Question About
1. That the liver changes proteins into urea. 2. That the liver produces bile. 3. Breathing is controlled by the medulla oblongata.	1. I thought only the gall bladder produced bile; the liver does also. 2. How important the liver is.	1. How does the digestive system relate to the skeletal system?

Directions Part 2

Collect the 3-2-1 sheets and scan them for understanding, misunderstandings, or concepts missed by the majority of the class. This activity should **not** be graded. It should, however, teach the student the value of reflecting on what was just discussed and learned, enabling the student to slow down and analyze the various components of the lesson.

✓ **Note:** Information found in the “1” column, “Thing I Have a Question About”, should be used to open class discussion the following class meeting.

Adapted from MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills. Mark A. Forget, Ph.D., ©2004.

Classroom Literacy Activity

Stump the Teacher: Stump the Student

Preparation Time:

0 + depending on the knowledge and confidence level of the teacher with the students asking them questions.

Time to Complete:

15 + or – minutes

Purpose:

Review of subject matter; motivating students to participate openly in the classroom; encouraging students to read the text; and encouraging students to think in higher order levels.

Directions Part 1

The teacher closes his/her book. The students keep their books, notes, and other study materials open. Students are given a certain amount of time, 3 to 5 minutes, to ask the teacher questions on the information that is being studied at the time. Each time the teacher is stumped the student asking the question is given 5 points on the next review or test. (The teacher should determine the prize or points and let the student know at the beginning of the strategy.)

✓ **Note:** Generally, students will ask knowledge level questions, such as who, what, when and where. Example: What is the name brand of the saw in Figure 1.4 in the text on page 456? The student form of questioning will improve and move to higher order thinking questions as modeled by the teacher.

Key: This strategy is to allow the student to know you are human. It is ok not to know. As a matter of fact, it is good to let the student stump you. Stumping the teacher builds confidence in some students.

Directions Part 2

The students close their books and the teacher opens his/her book. The teacher asks questions for a designated amount of time, usually the same amount the students were given to ask the teacher questions. Each time the student gets an answer correct, a prize or points should be awarded. If a student misses an answer, prizes or points should not be deducted.

✓ **Note:** This is a strategy to build confidence and interaction.

Directions Part 3

Once students are familiar and comfortable in participating in *Stump the Teacher: Stump the Student*, introduce the "Question Mark" which you will find on the next page. This helpful tool is designed to increase the student's higher order thinking skills and will assist the student in asking quality questions.

✓ **Note:** The *Question Mark* should be made into a bookmark for the students to have available during this activity or other interactive activities that increase higher order thinking skills.

Classroom Literacy Activity

QUESTION MARK

BOOKMARK FOR QUALITY QUESTIONS

Knowledge – Identification and recall of information

Who, what, when, where, how _____?

Describe _____?

Comprehension – Organization and selection of facts and ideas

Retell _____ in your own words.

What is the main idea of _____?

Application – Use of facts, rules, principles; demonstrates

How is _____ an example of _____?

How is _____ related to _____?

Why is _____ significant?

Explain the _____ process.

Analysis – Separation of a whole into component parts

What are the parts or features of _____?

Classify _____ according to _____.

Outline/diagram/web _____.

How does _____ compare/contrast with _____?

What evidence can you list for _____?

Synthesis – Combination of ideas to form a new whole

What would you predict or infer from _____?

What ideas can you add to _____?

How would you create/design a new _____?

What might happen if you combined _____ with _____?

What solutions would you suggest for _____?

Troubleshoot _____.

Evaluation – Development of opinions, judgments, or decisions

Do you agree _____?

What do you think about _____?

What is the most important _____?

Prioritize _____?

How would you decide about _____?

What criteria would you use to assess _____?

Adapted from *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Mark A. Forget, Ph.D., ©2004.

Classroom Literacy Activity

Directed Reading—Thinking: What I Know Sheet

Preparation Time:

10 + or - minutes for the teacher. Preparation time is needed to preview the information or text with the students prior to using the Directed Reading Activity, What I Know Sheet.

Time to Complete:

30 to 40 + or – minutes

Purpose:

To provide a directed reading and thinking activity that will allow students to use their own curiosity to set the purpose for reading. This activity helps students to learn new information and make connections with prior knowledge and students will begin drawing conclusions from printed text by thinking inferentially.

Directions Part 1

The teacher briefly previews the new information with the students as a whole-class team. Students complete the *What I Know Sheet* after the preview. The teacher then facilitates the discussion by moving through the three columns on the sheet.

- ✓ **Note:** The teacher should be prepared for questions that seem outlandish at first, but that can actually lead to inferential reading on the part of most students.

Directions Part 2

After reviewing the *What I Know Sheet* with the whole-class team, students read a short portion of the materials individually. Ask students to discuss their interpretations of the new information in a whole-class team setting. Ask if any of them found the answers to their questions and discuss the questions and answers. Repeat the short portion reading of materials individually and whole-class team discussion until all new information has been read and discussed.

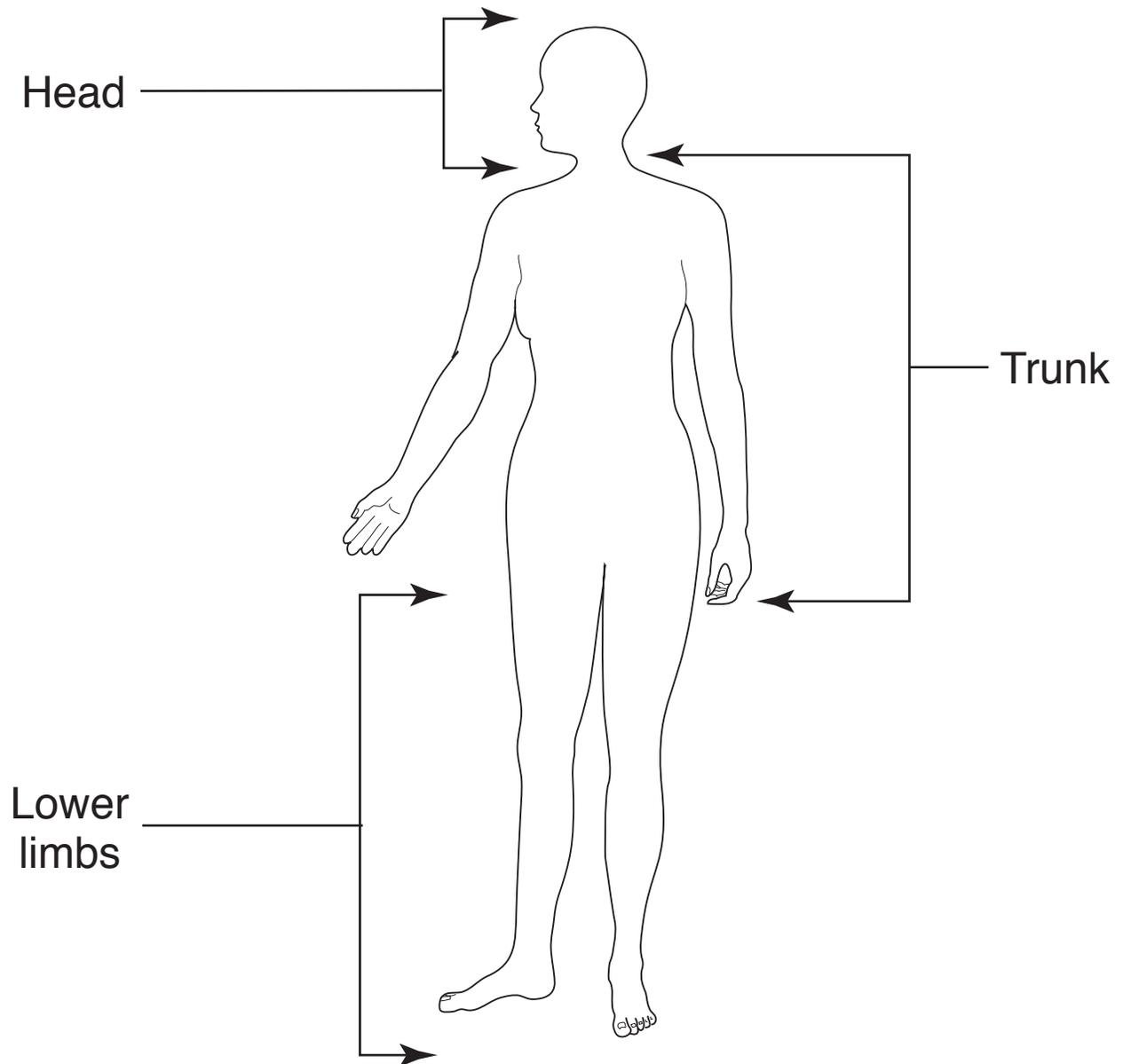
- ✓ **Note:** The teacher will need to read simultaneously with students to set an example and may need to model for inferential thinking the first several times this strategy is used. The teacher is the facilitator and establishes the desire for learning, by assisting students to draw conclusions and interpret text. Recognize the validity of a student's questions in setting purposes for reading. The "Question Mark" in *Stump the Teacher: Stump the Student* could assist students in question prompts and in developing higher order thinking during reading.

Adapted from *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Mark A. Forget, Ph.D., ©2004.

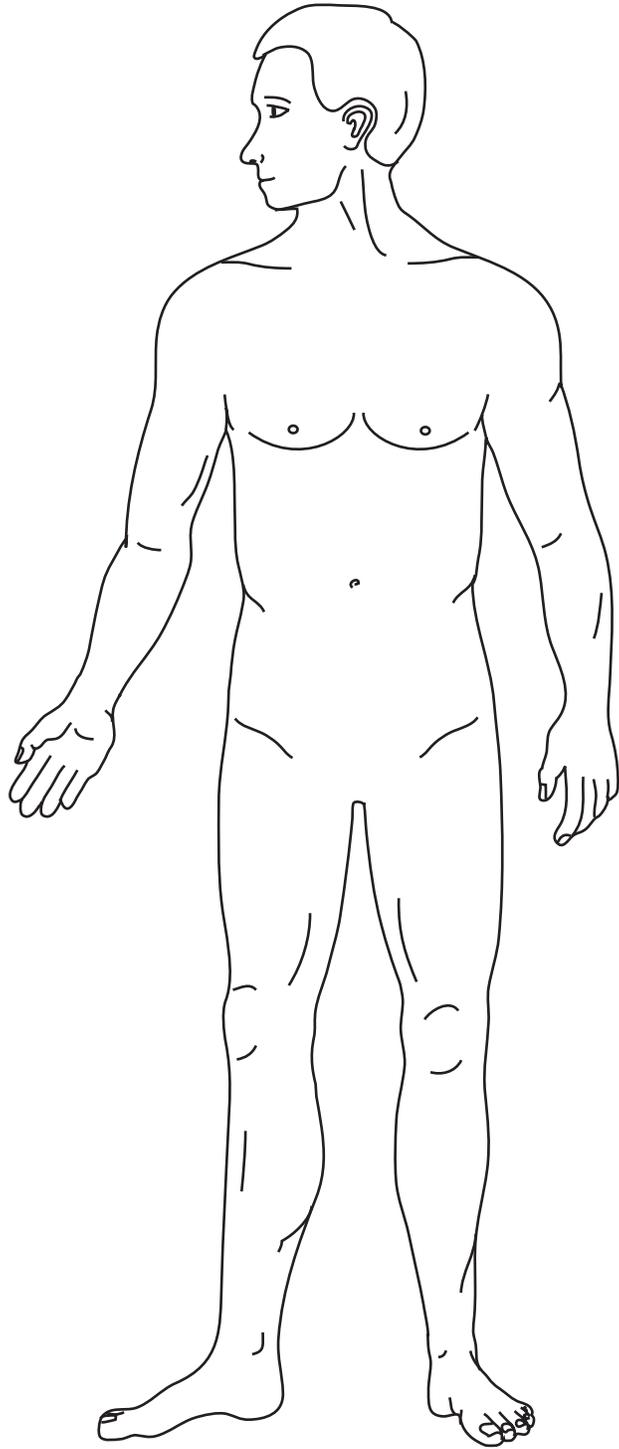
Classroom Literacy Activity

K	W	L
What I Know After Previewing	What I Want to Find Out	What I Learned

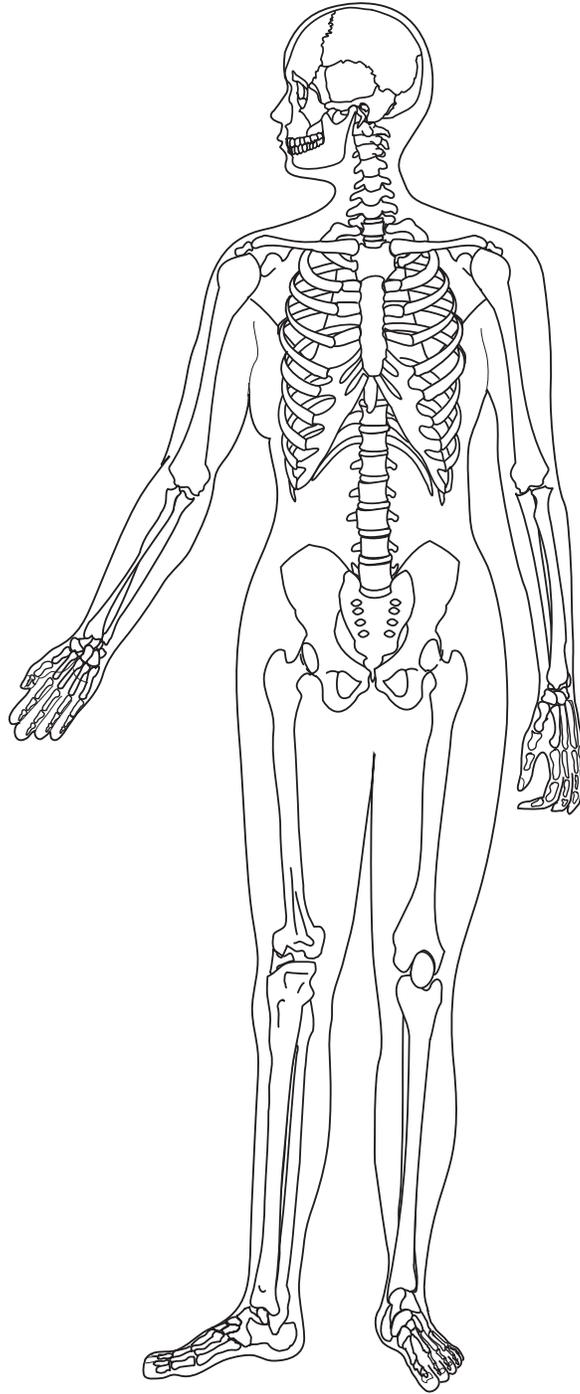
General Regions of the Body



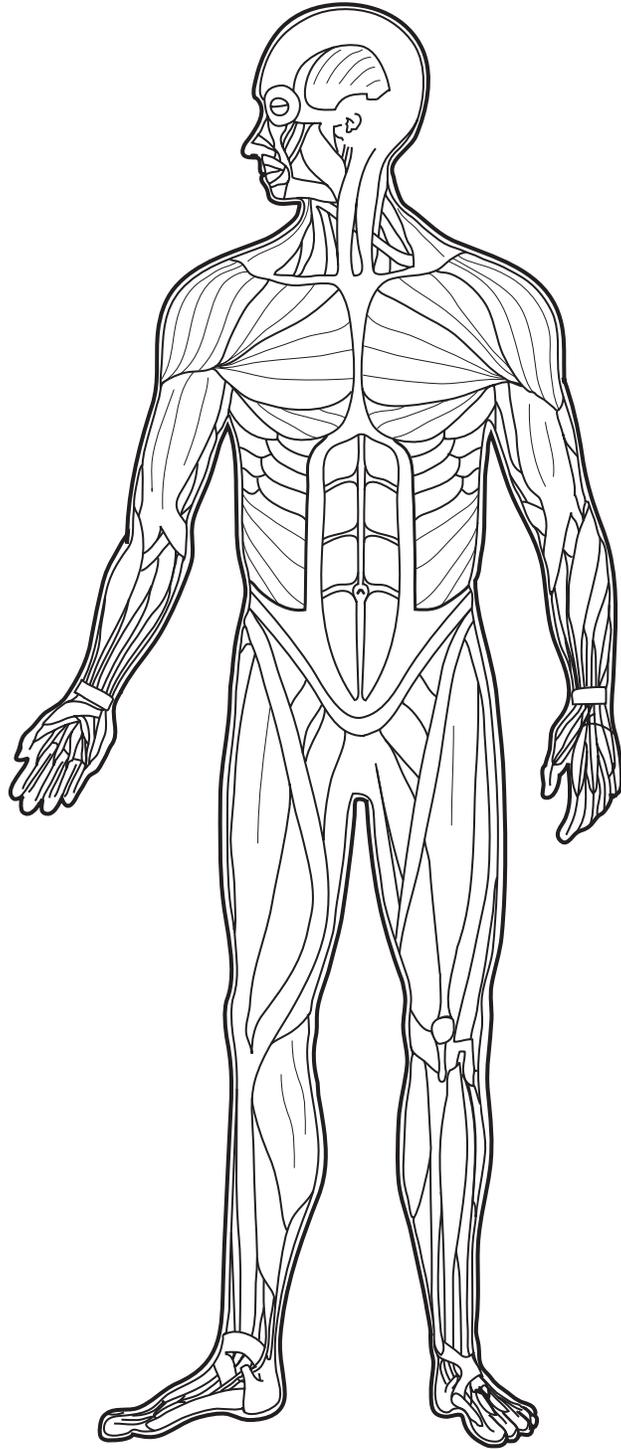
Integumentary System



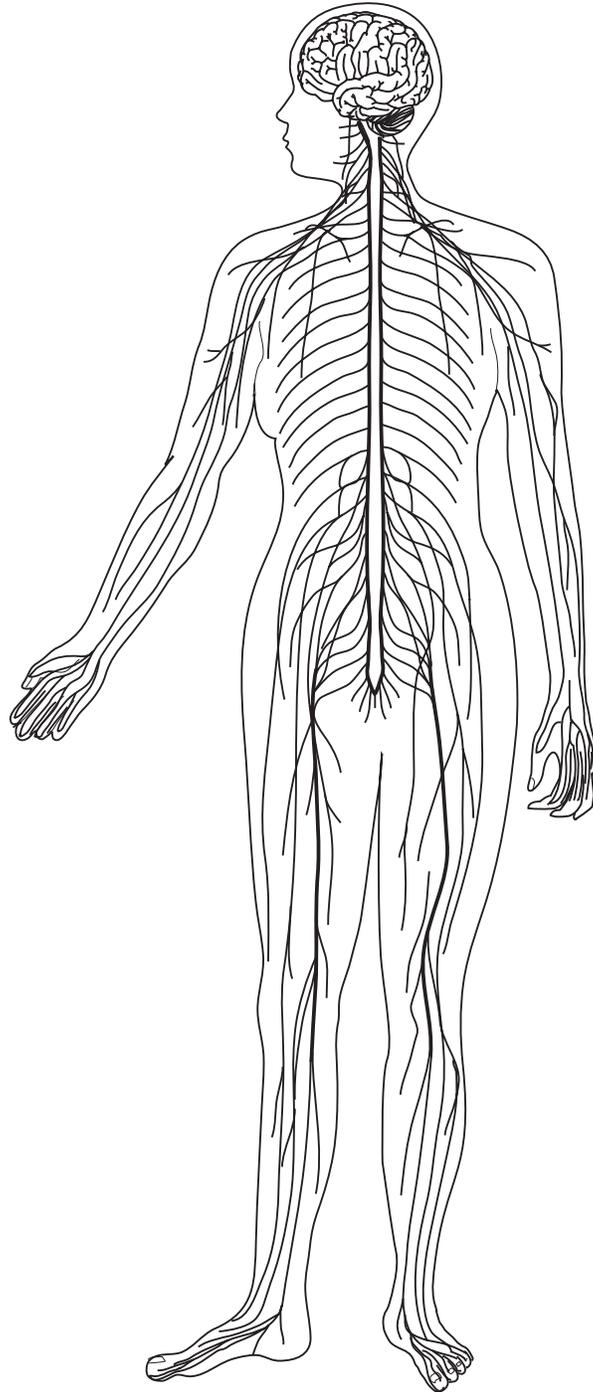
Skeletal System



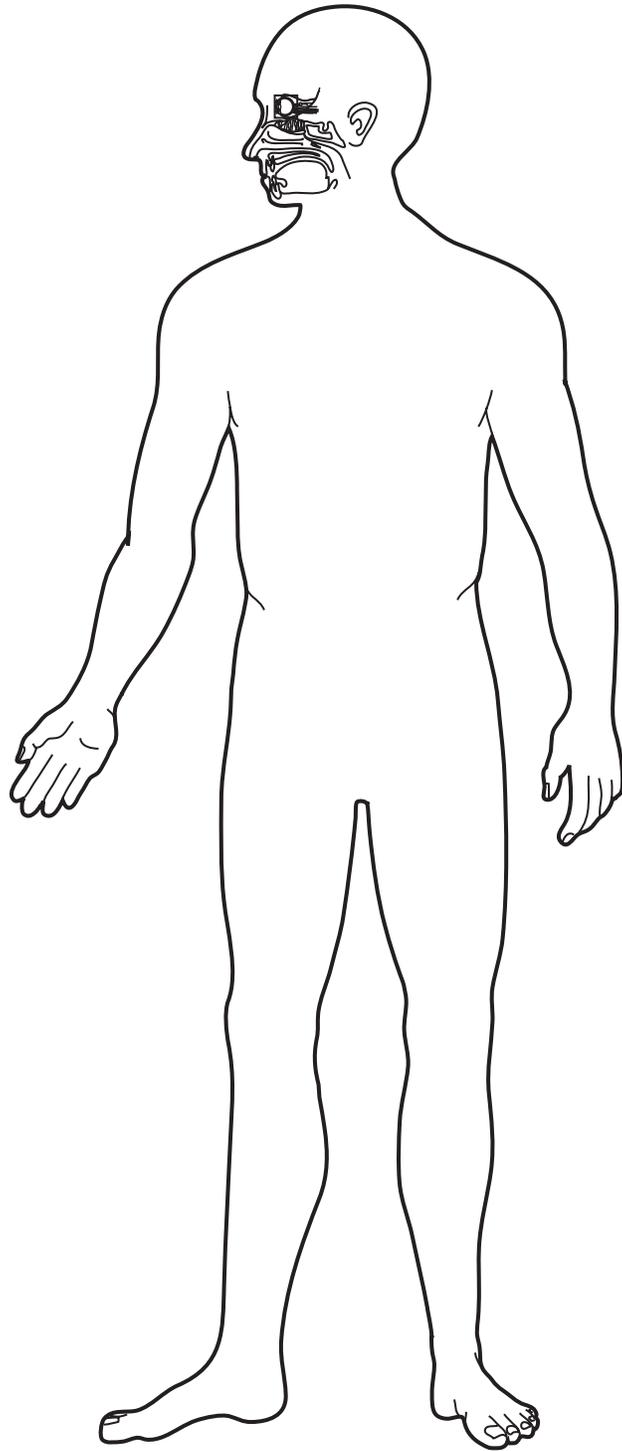
Muscular System



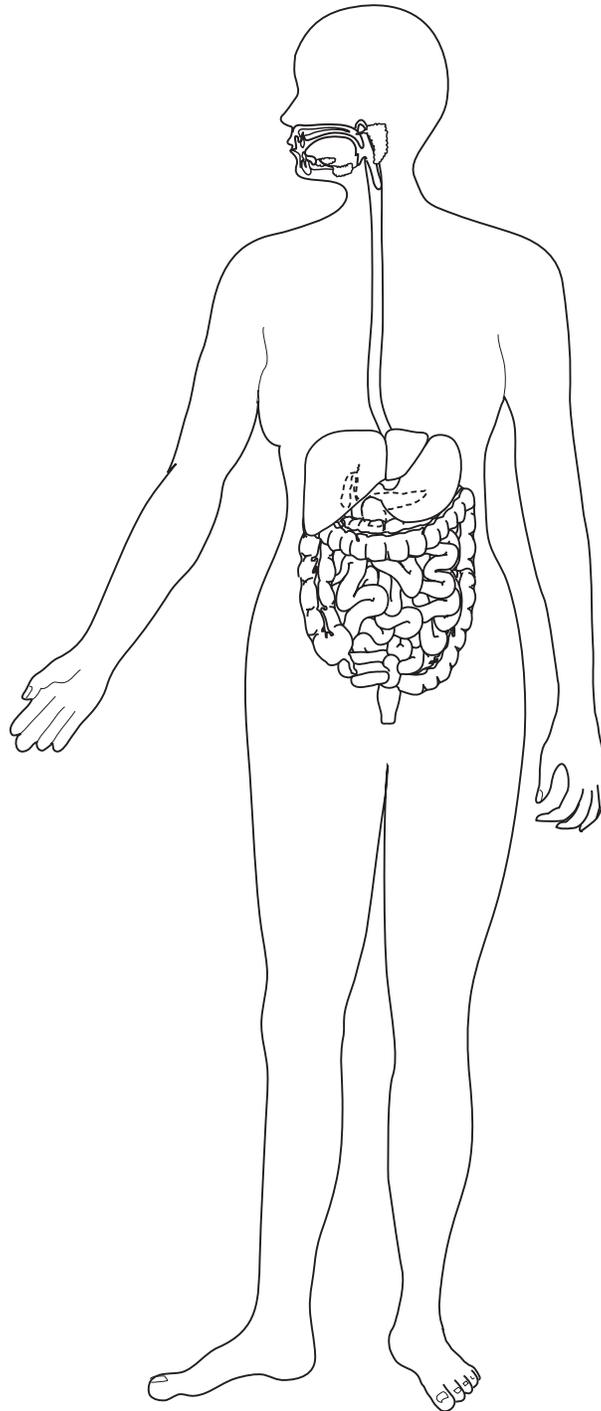
Nervous System



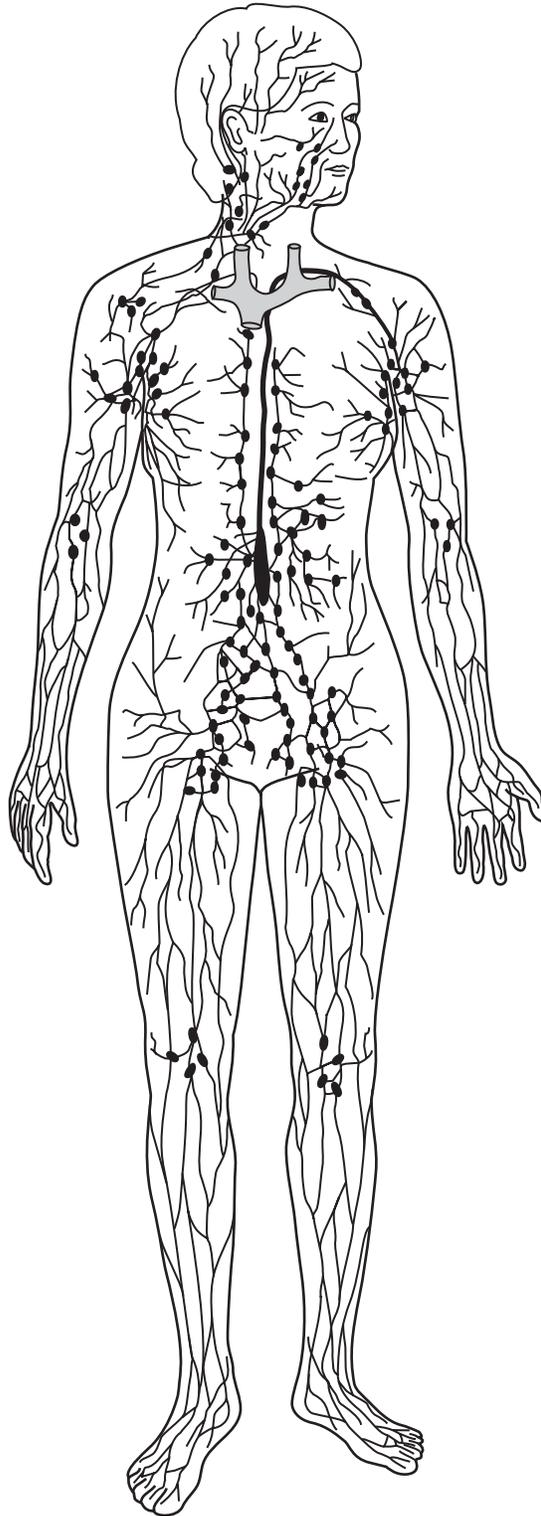
Special Senses



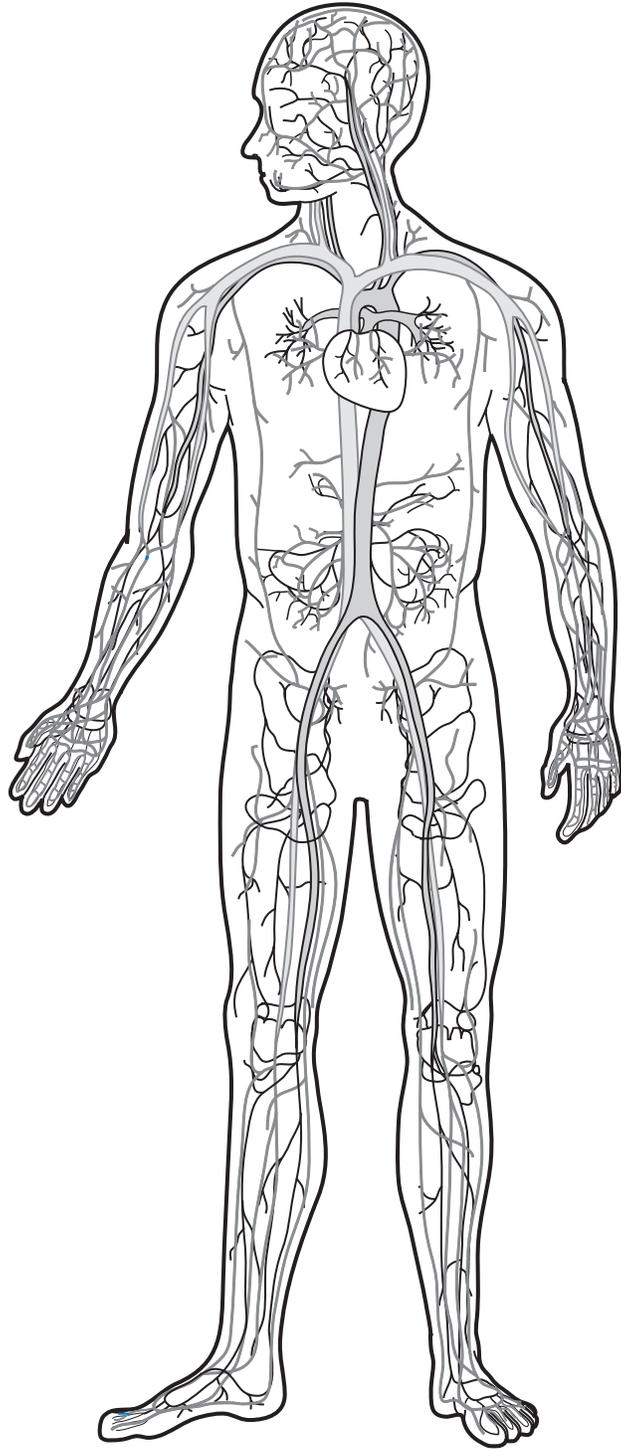
Digestive System



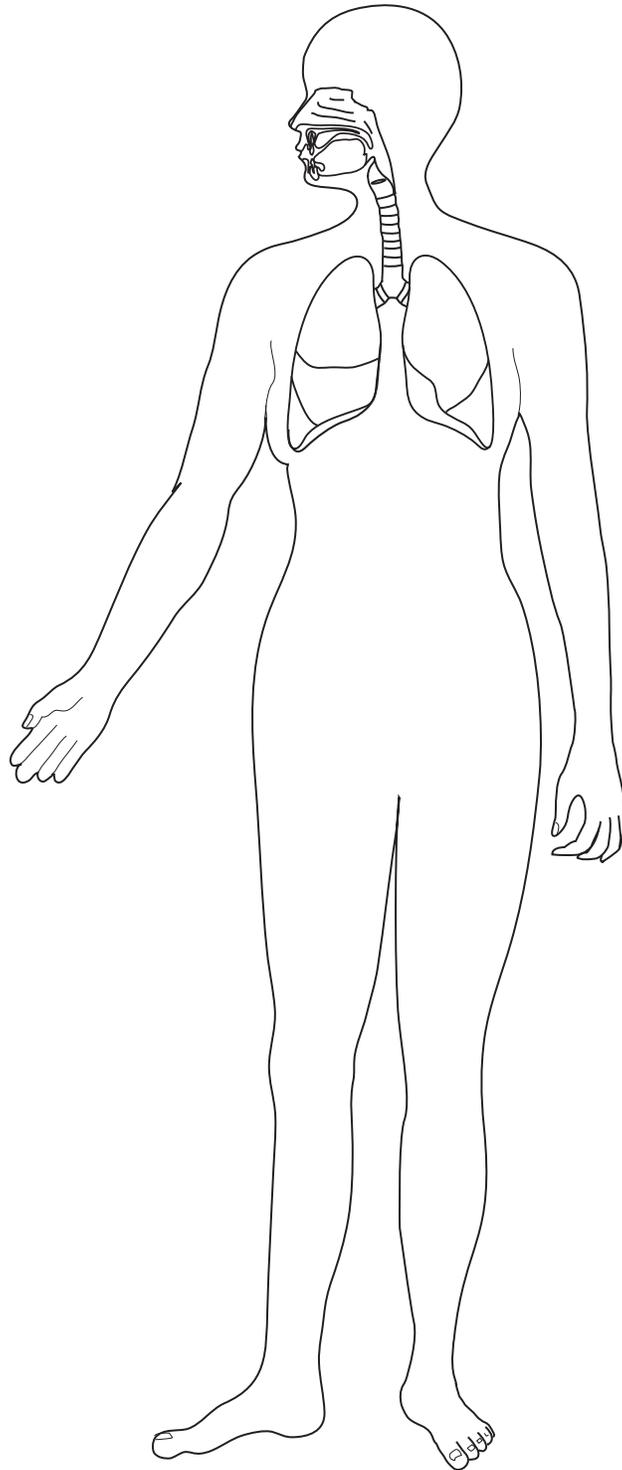
Circulatory System: Lymphatic



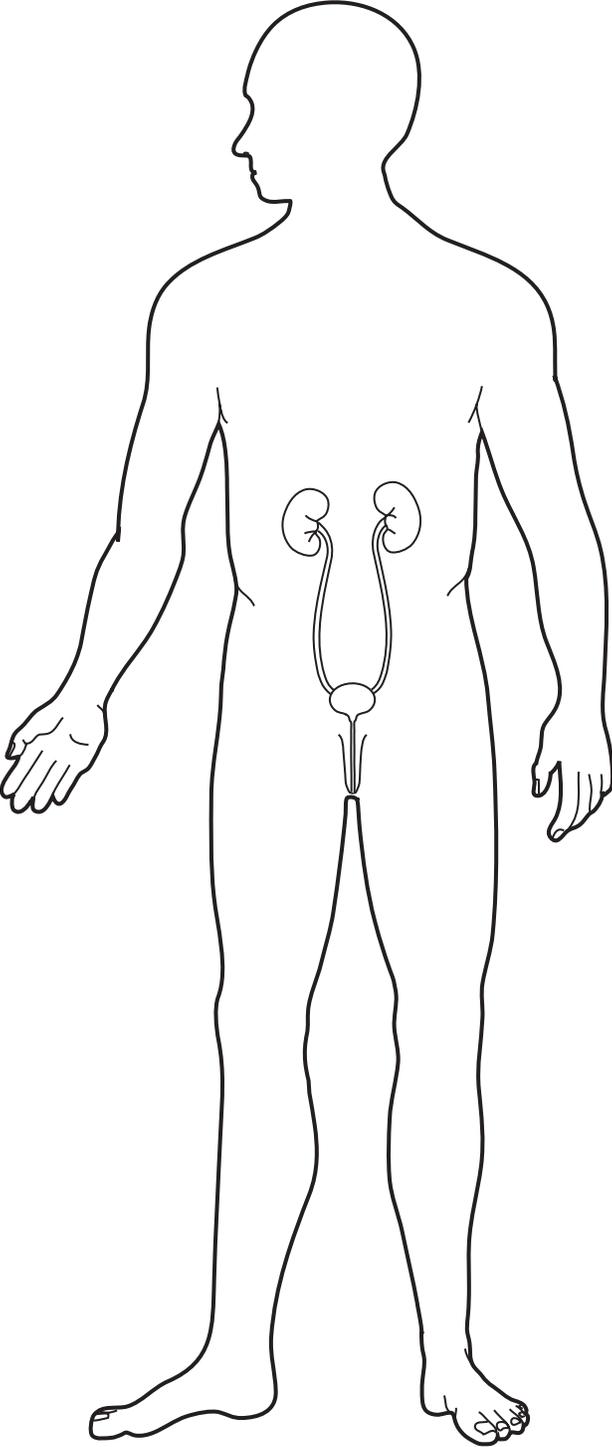
Circulatory System: Blood



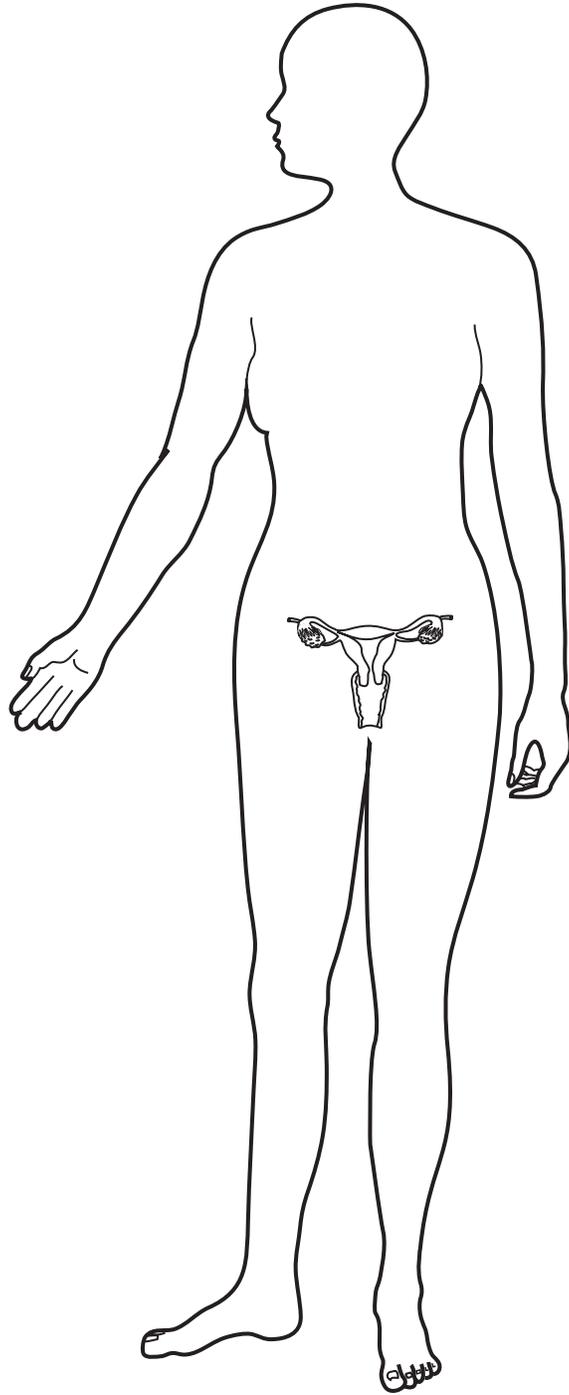
Respiratory System



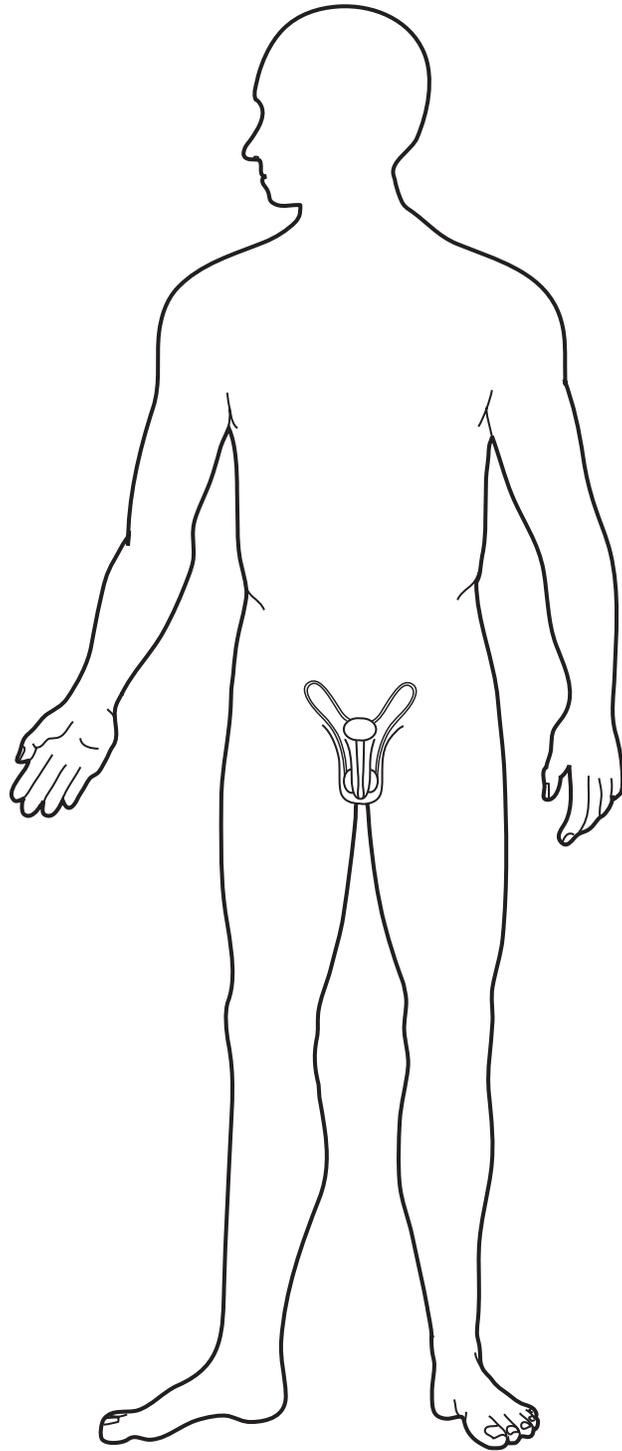
Urinary System



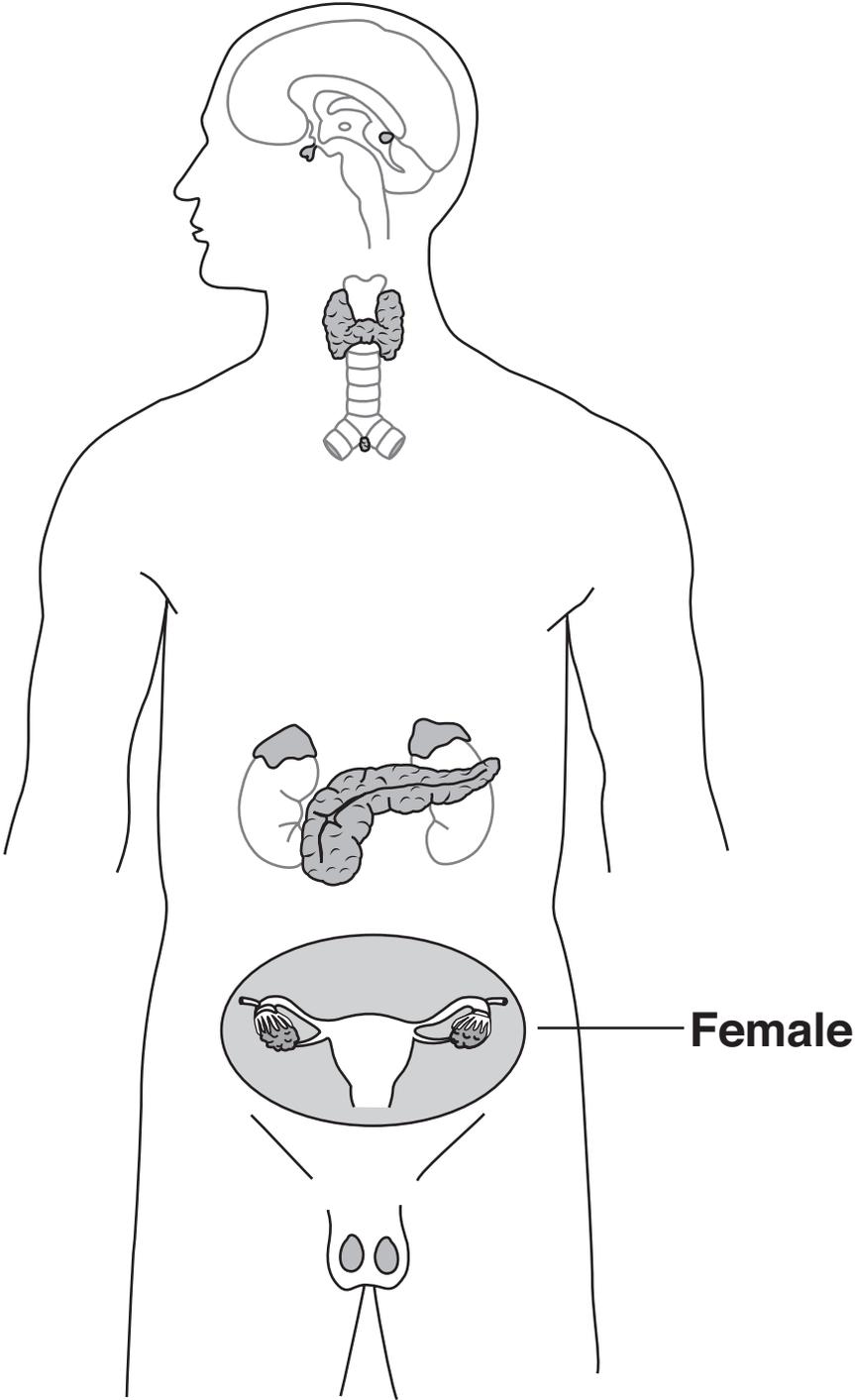
Reproductive System (Female)



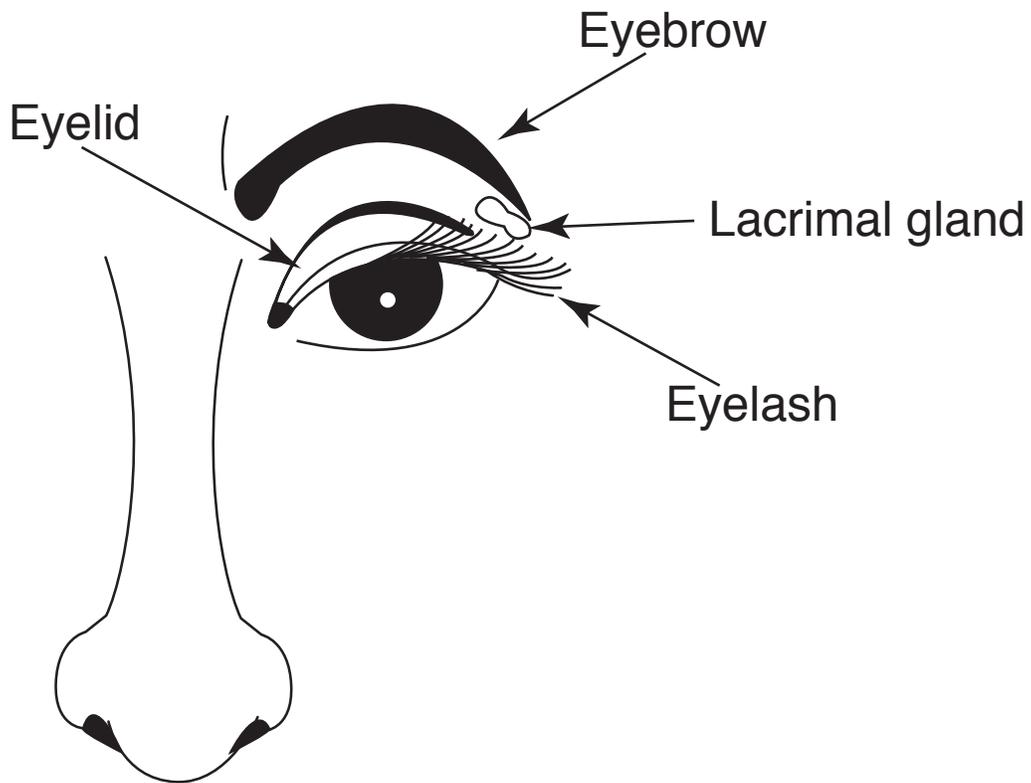
Reproductive System (Male)



Endocrine System



Accessory Structures of the Eye



Module Contents

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	* Assignment Sheets are located in the Student Workbook.		

Instructional
Plan**Suggested Activities****Preparation**

- Read the module carefully and plan for instruction.
- Review “Teaching Suggestions.” Plan for classroom activities.
- Plan your presentation to take advantage of student learning styles and to accommodate special-needs students.
- Prepare classroom. Put up posters and charts and display articles and other references related to this module.
- Obtain resources to supplement instruction of this module. See “Resources Used in Developing This Module” and “Suggested Supplemental Resources.”
- Review the “Suggested Web Sites,” and make a list of additional sites you may have found for students to research to learn more about biochemistry and microbiology.
- For self-paced instruction, review Learning Activities Sheet. Go to “customizable files” link on teacher edition CD and modify as appropriate to include additional activities and/or resources available in your classroom. Make one copy for each student.
- Make copies of any teacher supplements that you have created that will be provided for each student.
- Make transparencies from the transparency masters included in this module. These appear in teacher edition only. A PowerPoint® presentation of transparencies is located on the teacher edition CD.

Delivery and Application

Module Introduction (self-paced instruction)

- Refer student to Learning Activities Sheet and module of instruction located in student guide.
- Review module contents with student.
- Have the student complete the steps in the Learning Activities Sheet.

Module Introduction (group instruction)

- Provide students with the module of instruction in the student edition.

Suggested Activities

- Discuss the information sheet. Implement teaching plan to localize, supplement, and personalize the module. Reinforce basic academic and workplace skills when applicable.
- Discuss the assignment sheets. Review with students the criteria for evaluation of these activities.

Teaching Suggestions

- ✓ **Note:** Many students are likely to be intimidated by subjects such as chemistry and biology. By emphasizing the building-block organization of the module's objectives, you should be able to guide them comfortably through the material.
- Select one of the classroom literacy activities provided in Module 1, Teacher Supplement 1. Use with students to help them improve their literacy skills (reading, writing, speaking, listening, and thinking) and to learn new subject matter.
- If your facility includes instruction in sciences such as chemistry and biology, check with other instructors about possible resources for use with this module. Helpful materials include a model of an atom, a periodic table of the elements, and other materials.
- Discuss the chemical formula for water (H_2O) and how that is basic chemistry. Point out that water is an important component of the body.
- Demonstrate compounds, mixtures, and solutions. One good way to make a mixture is to combine iron filings with sawdust. A magnet can be used to separate the two components of the mixture. In demonstrating solutions, use salt or sugar and water to show how a substance can dissolve in a liquid. Add the material until the saturation point is reached and then stir the solution or heat it to show how the addition of energy can increase the liquid's capacity to dissolve.
- If your chemistry skills are adequate, demonstrate the various types of chemical reactions and the rules that govern them.
- Ask a chemistry teacher to demonstrate the effects of chemicals in hair products on strands of hair. Stress the importance of doing a strand test.
- Use crossword puzzle (Assignment Sheet 1) to help reinforce the terms presented in objectives 1 through 10.
- Relate cell composition to the study of chemicals. Use a variety of cell types to discuss parts of a cell so that students can correlate the parts of a cell to various structural arrangements.

Suggested Activities

- Use crossword puzzle (Assignment Sheet 2) to help reinforce the terms presented in objectives 11 through 18.
- For Assignment Sheet 3, obtain materials for students to use in constructing their model of a cell. Construction paper is an inexpensive material that provides students with flexibility in their design of a cell.
- Use crossword puzzle (Assignment Sheet 4) to help reinforce the terms presented in objectives 19 through 24.
- For Assignment Sheet 5, divide the class into teams to research and develop their presentation. All topics should be covered by at least one team.
- Use module review (Assignment Sheet 7) to assess student knowledge of biochemistry and microbiology.

Evaluation

- Make copies of the written test. Using the Word® file included on the teacher edition CD, add or modify test items as needed. The written test serves as both a pretest and posttest to assist in measuring each student's competency gains.
- Give and evaluate pretest. Modify lesson plan to include additional instruction for those areas where students were deficient.
- Evaluate the assignment sheets. Rate the student using the criteria listed on each assignment sheet. See Answers to Assignment Sheets for correct answers where applicable. If the student's performance is unacceptable, have the student review the appropriate materials and complete the assignment again.
- Give and evaluate the posttest.
- Meet individually with students to evaluate their progress through this module of instruction and indicate to them possible areas for improvement.
- Reteach and retest as required.

Resources Used in Developing This Unit

Print Media

- *Anatomy and Physiology*. Stillwater, OK: Multistate Academic and Vocational Curriculum Consortium, Inc., 2002.
- Gray, Henry. *Gray's Anatomy*, 39th ed. New York: Mosby, 2004.
- Gylys, Barbara A., and Regina Masters. *Medical Terminology Simplified*, 3rd ed. Philadelphia: F.A. Davis Company, 2005.

Suggested Activities

Suggested Supplemental Resources

- Scanlon, Valerie C. and Tina Sanders. *Essentials of Anatomy and Physiology*, 4th ed. Philadelphia: F.A. Davis Company, 2002.
- Thibodeau, Gary A., and Kevin T. Patton. *Anatomy and Physiology*, 5th ed. St. Louis: Mosby, 2002.

Print Media

- *Basic Operator*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2006.
- *Basic Esthetician*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.
- *Basic Manicurist*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.

Suggested Web Sites

- ✓ **Note:** The following web sites offer general information about anatomy and physiology and generally cover more than one body system.

- opencourse.org/collaboratories/harveyproject

The Harvey Project is an international collaboration of educators, researchers, physicians, students, programmers, instructional designers, and graphic artists working together to build interactive, dynamic human physiology course materials on the World Wide Web. Materials produced by the Harvey Project are available free to educational institutions. The site is constantly updated and should be checked often and browsed for overall content. The address provided is for the home page. By clicking the WEB button, you will be taken to an index of links divided into categories such as general physiology and specific systems. The number of links in each category is indicated in parentheses after the topic.

- <http://www.innerbody.com/htm/body.html>

This site provides a great deal of information on the human body in fun, interactive formats. There is a great deal of emphasis on terminology and body parts.

- ✓ **Note:** Web-site addresses were accurate and all content on referenced web sites was appropriate during development and production of this product. However, web sites sometimes change; MAVCC takes no responsibility for a site's content. The inclusion of a web site does not constitute an endorsement of that site's other pages, products, or owners. You are encouraged to verify all web sites prior to use.

Answers to Assignment Sheets

Assignment Sheet 1

Complete the Crossword Puzzle of Terms (Objectives 1–10)

1 SHELL 2 NUCLEUS
 3 HYDROLYSIS 4 BATTER
 5 BILIPID 6 LIQUID 7 PROSODIC
 8 LUBRICATE 9 OXIDATION 10 HOMEOSTASIS
 11 MOLECULE 12 POLYMERIZATION 13 MISCELLANEOUS
 14 MITOCHONDRION 15 RESALT 16 ION 17 MATTER 18 SALT
 19 MATTER 20 SALT 21 CELL 22 ACID
 23 CENTRIFUGE 24 CHEMICAL REACTION 25 CATALYST
 26 ENERGY 27 ENERGY 28 BOND
 29 CONCENTRATION
 30 ORGANIC COMPOUND

Answers to Assignment Sheets

Assignment Sheet 5

Develop a Presentation on Bacteria, Viruses, Fungi, or Parasites

This assignment to be evaluated by the instructor using the evaluation criteria stated on the assignment sheet.

Assignment Sheet 6

Analyze Cosmetology Scenarios

Answers should include key points, but may be in the student's own words.

Answers to Scenario 1

1. What are some examples of arthropods?

Spiders, lobsters, crabs, ticks, fleas, flies, mosquitoes, lice, mites, bees, scorpions

2. What should you do?

Verify with Ms. Lane that there is no infection present. Examine Ms. Lane to make sure there are no arthropods present and decontamination has taken place through the supervision of a physician. Inspect the bites if they are in the area you will be working.

Decision making—If there are no arthropods, abrasions, open wounds, or pus present, proceed with services.

Decision making—If arthropods, abrasions, open wounds, or pus are present, suggest to Ms. Lane that services may hinder her healing and depending on the arthropods present she may be contagious. Ask her to follow the doctor's directions, and return for services once the arthropods are absent and abrasions have healed. Clean all implements, capes and towels with a decontaminate, and sterilize your hands.

Answers to Scenario 2

1. In your professional opinion, what is the green color on the nail pate?

A fungus has begun to grow on the nail plate.

2. What should you do?

Protect yourself from the fungus. Inspect the nails on each finger. Suggest removal of the artificial nails to ensure the fungus has not spread to other fingers.

Decision making—If the fungus is localized to one finger and does not appear to have developed beyond the beginning stage, treatment may be applied directly to the affected area.

Answers to Assignment Sheets

Decision making—If the fungus has spread to multiple fingers or if the fungus is serious and appears to be advanced, refer Ms. Lin to a physician for medication to correct the problem; set an appointment with Ms. Lin after the fungus has been cleared. Clean your implements and table thoroughly with a decontaminate, and clean and sterilize your hands before your next client arrives.

Answers to Scenario 3

1. In your professional opinion, what is causing the nodules and the itch Lequisha is experiencing?

Pedunculosis Capitis, commonly known as head lice

2. What should you do?

Stay calm and comfort Mr. Lewis and Lequisha. Inform Mr. Lewis that Lequisha has come into contact with a parasite that is causing the white flakes and itch: inform Mr. Lewis that the disorder is called pedunculosis capitis, commonly known as head lice. Inform Mr. Lewis that he should not be overly concerned, but the situation needs to be taken care of immediately.

Let him know that you cannot treat Lequisha because the organism is contagious. Refer him to a druggist or physician for a special shampoo for Lequisha's hair, scalp and body and a spray for Lequisha's bed and clothing and other items that she has come into contact with recently. Explain that the entire family should be inspected for the organism and encourage Mr. Lewis to take care of the issue today. Reassure Mr. Lewis and Lequisha as much as possible, and do not announce this to the entire salon to avoid possible embarrassment for the clients.

Clean and sanitize all implements, capes, and towels that came into contact with the client; (You may want to spray cloth items with a tick and lice spray that kills arthropods.) Clean and sanitize your hands.

Answers to Assignment Sheets

Assignment Sheet 7

Complete Module 2 Review

- | | | | |
|-----|---|-----|---|
| 1. | a | 26. | b |
| 2. | c | 27. | d |
| 3. | d | 28. | b |
| 4. | c | 29. | a |
| 5. | d | 30. | a |
| 6. | b | 31. | d |
| 7. | c | 32. | a |
| 8. | c | 33. | c |
| 9. | b | 34. | b |
| 10. | a | 35. | c |
| 11. | c | 36. | c |
| 12. | d | 37. | b |
| 13. | c | 38. | d |
| 14. | d | 39. | b |
| 15. | a | 40. | b |
| 16. | c | 41. | d |
| 17. | a | 42. | b |
| 18. | a | 43. | c |
| 19. | c | 44. | d |
| 20. | d | 45. | c |
| 21. | a | 46. | d |
| 22. | b | 47. | d |
| 23. | b | 48. | a |
| 24. | a | 49. | c |
| 25. | c | 50. | b |

Written Test

Name _____

Date _____ Score _____

Objective 1

Define the terms *biochemistry* and *microbiology*. Write your answers on the blank lines provided beside the terms below.

a. Biochemistry _____

b. Microbiology _____

Objective 2

Complete statements concerning the role of chemistry in human health. Write your answer on the blank lines provided below.

a. Most body activities involve _____.

b. For a person to remain healthy, the chemicals within the body must remain properly _____.

c. The body also produces special chemicals that regulate _____ functions.

d. Chemicals entering the body from the _____ can affect the balance of chemicals within the body and can disrupt normal physiological chemical reactions.

e. _____ and diseases can change the chemical balance within the body and can disrupt chemical reactions.

Objective 3

Define the term *homeostasis*. Write your answer on the blank lines provided beside the term below.

a. Homeostasis _____

Written Test

Objective 4

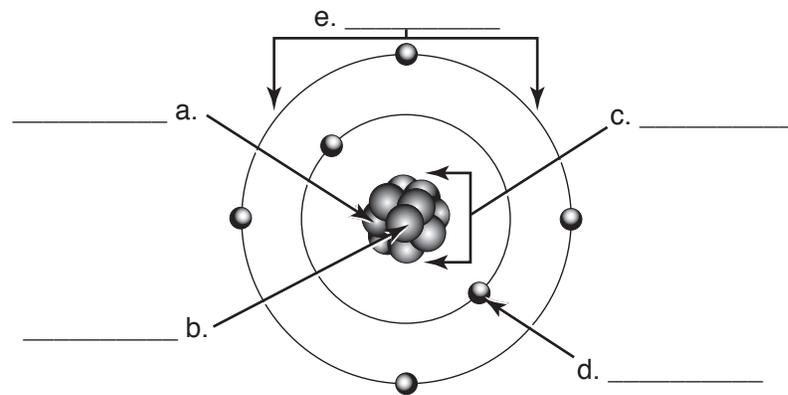
Define the terms *element* and *atom*. Write your answers on the blank lines provided beside the terms below.

a. Element _____

b. Atom _____

Objective 5

Label the parts of an atom. Write your answers on the blank lines provided beside the illustration below.



Objective 6

Define the term *molecule*. Write your answers on the blank lines provided beside the terms below.

a. Molecule _____

Objective 7

Distinguish among the definitions of the terms compound, mixture, and solution. Write a “C” on the blank before the definition of a compound, an “M” before the definition of a mixture, and an “S” before the definition of a solution.

_____ a. A substance that consists of two or more combined components that do not interact chemically; to separate its components requires either a mechanical method or the application of energy

_____ b. A substance that consists of atoms of two or more different elements bonded together as molecules; to separate its components into other compounds and elements requires a chemical reaction

_____ c. A substance that consists of one or more components dissolved in a liquid; to separate its components, the energy of the substance must change so that the energy balance between the components prevents the liquid from being able to hold the dissolved material

Written Test

Objective 11

State the cell theory. Write your answer on the blank lines provided below.

Objective 12

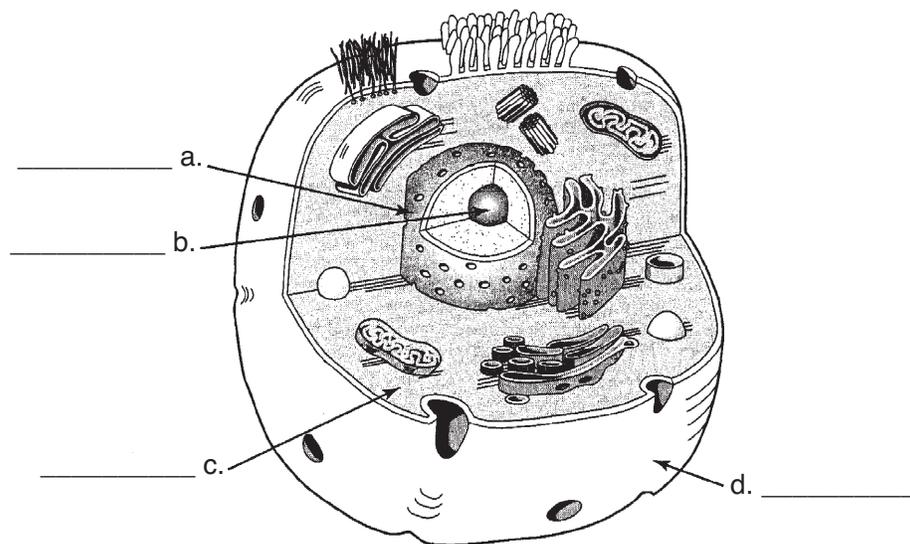
Define the principal types of protoplasm. Write your answers on the blank lines provided beside the terms below.

a. Cytoplasm _____

b. Nucleoplasm _____

Objective 13

Label the major parts of a cell. Write your answers on the blank lines provided beside the illustration below.



Objective 14

Distinguish among the major parts of a cell. Place a "CM" before the function of the cell membrane, an "N" before the function of the nucleus, and a "C" before the function of cytoplasm.

_____ a. Provides structure to the cell and supports other parts of the cell

_____ b. Regulates cellular structure and activities, including reproduction of the cell

_____ c. Allows some molecules to enter the cell while preventing entry by other molecules

Objective 15

Distinguish among the major parts of a cell nucleus. Place a “C” before the description of a chromosome, an “NM” before the description of the nuclear membrane, and an “N” before the description of the nucleolus.

- _____ a. One of several strands of DNA that contains the genetic code that determines inherited traits
- _____ b. A thickening of the outer surface of the nucleus protoplasm that regulates the movement of materials into and out of the nucleus
- _____ c. A dense spherical structure within the nucleus that is involved in protein synthesis and that forms ribosomal RNA

Objective 16

Describe the specialized structures of cells. Write your answers on the blank lines provided beside the terms below.

- a. Cilia _____

- b. Flagellum _____

Objective 17

Distinguish between the functions of the specialized structures in cells. Place a “C” next to the function of cilia and an “F” next to the function of flagellum.

- _____ a. Helps to propel a cell
- _____ b. Help to propel fluid in one direction over the surface of cells

Objective 18

List six of the eight functions of a cell. Write your answers on the blank lines provided below.

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____
- f. _____

Written Test

Objective 19

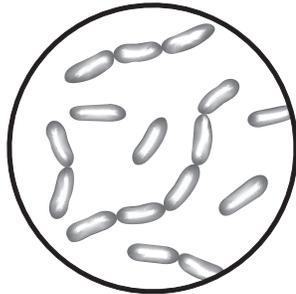
Match the classes of microorganisms with their descriptions. Write the numbers on the blanks provided.

- | | | |
|--------------|--------------|--------------|
| 1. Bacterium | 3. Protozoan | 5. Worm |
| 2. Virus | 4. Fungus | 6. Arthropod |

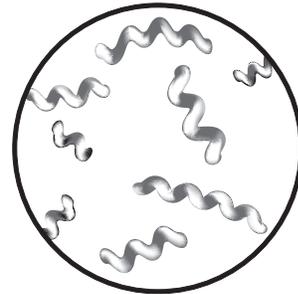
- _____ a. A unicellular or multicellular organism that reproduces by means of spores
- _____ b. An invertebrate organism with six or more jointed legs and an exoskeleton
- _____ c. A subcellular organism that reproduces as a parasite within other organisms
- _____ d. A multicellular organism that in its parasitic form can be pathogenic to humans
- _____ e. A widely distributed unicellular organism that may or may not cause a disease
- _____ f. A unicellular organism that is adapted for life in water and forms cysts that pass from host to host

Objective 20

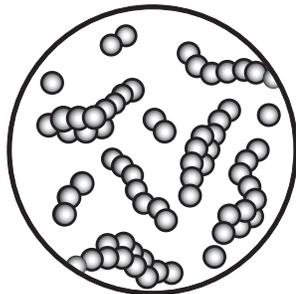
Identify the classes of microorganisms as classified by their shape. Write your answers in the blanks provided.



a. _____



b. _____



c. _____

Written Test

Objective 21

Complete statements that describe the characteristics of bacteria. Write your answers on the blank lines provided in each of the statements below.

- a. The tough _____ gives a bacterium its shape.
- b. Cocci and bacilli often colonize with each other so that another way of identifying bacteria is by the _____ of their colonies.

Objective 22

Complete statements that describe the characteristics of viruses. Write your answers on the blank lines provided in each of the statements below.

- a. Viruses are nucleic acids within shells of _____.
- b. Each virus exhibits a _____ that is characteristic of that virus.
- c. Viruses can only _____ when they are within the living cells of a host organism.
- d. A virus will use the nucleic acid and _____ of an infected cell to produce other viruses, often multiplying to the point that the host cell ruptures and dies.
- e. The severity of a viral disease depends on the _____ of cells that are infected.
- f. Some viruses can become _____ so that they present no signs of infection and then become active again after a period of time, even years later.
- g. Antiviral _____ are difficult to develop because viruses reside inside cells, use the cell's chemicals to reproduce, and offer few functions that can be attacked without harming the host organism.

Objective 23

Select from the following list the characteristics of fungi. Place an "X" on the lines next to the correct characteristics.

- _____ a. Fungi may be unicellular or multicellular.
- _____ b. Some fungi are normally found in and on the body.
- _____ c. Fungus generally occurs as a result of a break in the skin or a trauma.
- _____ d. Fungal infections may result from the use of antibiotics.
- _____ e. Most fungal infections are superficial but can spread to the inside of the body through spores.
- _____ f. Fungus exhibits a shape that is characteristic to its type.

Written Test

Objective 24

Complete statements that describe common parasites that afflict humans. Write your answers on the blank lines provided in each of the statements below.

- a. Parasitic worms live off _____ in the host's body, in the host's blood, or on the host itself.
- b. Many parasitic worms have several stages of life involving _____. larvae, and adult stages.
- c. Parasitic worms generally inhabit specific _____.
- d. Mites and _____ generally afflict the surface of a host's body and present little direct risk to the host.
- e. Parasites such as fleas, mosquitoes, and ticks may be _____ of disease.

***Permission to duplicate this test is granted.**

Answers to Written Test

- Objective 1** a. Biochemistry—The study of chemistry as it relates to life
 b. Microbiology—The study of extremely small life
- Objective 2** a. chemical reactions
 b. balanced
 c. body
 d. external environment
 e. injuries
- Objective 3** Homeostasis—The state of the body in which conditions remain relatively stable despite changes in the environment
- Objective 4** a. Element—One of more than 100 primary, simple substances that cannot be broken down by chemical means into any other substance
 b. Atom—The smallest division of an element that exhibits all the properties and characteristics of the element
- Objective 5** a. Proton (+ charge)
 b. Neutron
 c. Nucleus
 d. Electron (– charge)
 e. Shell
- Objective 6** Molecule—A structure consisting of two or more atoms
- Objective 7** a. M
 b. C
 c. S
- Objective 8** a. 3
 b. 2
 c. 4
 d. 1
- Objective 9** a. ions
 b. salts
 c. concentrations

Answers to Written Test

Objective 10

Answers may be in student's own words, but should include the following points:

- Acids and bases are classed as strong, using a value called *pH*, with the most-acidic substances having a value toward 0 and the most-basic substances having a value toward 14.
- Body fluids have a normal pH value with a narrow range above and below that value.
- If the pH value of a fluid goes above or below its ideal range, chemical reactions will be affected.
- Normal human activities can lead to major shifts in pH.

Objective 11

Answers may be in student's own words, but should include the following points:

- All organisms are made of small, enclosed bodies called cells and of the products of those cells.
- Cells are small bits of organized protoplasm encased in thickened membrane. In multicellular organisms, cells tend to have a specialized function that contributes to the overall functioning of the organism.

Objective 12

- a. Cytoplasm—The protoplasm found outside the nucleus of a cell
- b. Nucleoplasm—The protoplasm found in the nucleus of a cell

Objective 13

- a. Nucleus
- b. Nucleolus
- c. Cytoplasm
- d. Cell membrane

Objective 14

- a. C
- b. N
- c. CM

Objective 15

- a. C
- b. NM
- c. N

Objective 16

- a. Cilia—Hair-like projections of the cells that form the mucous lining of the respiratory system and other passageways
- b. Flagellum—A single hair-like projection on a sperm cell

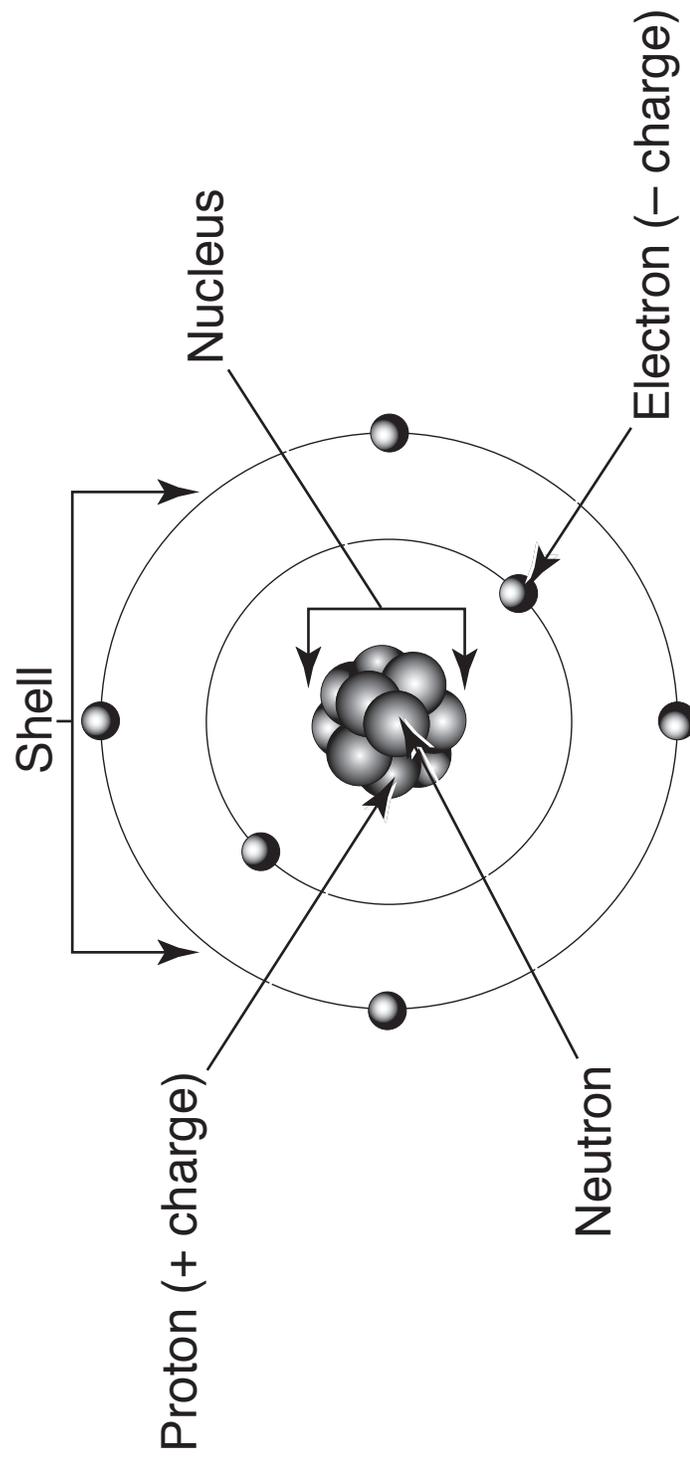
Objective 17

- a. F
- b. C

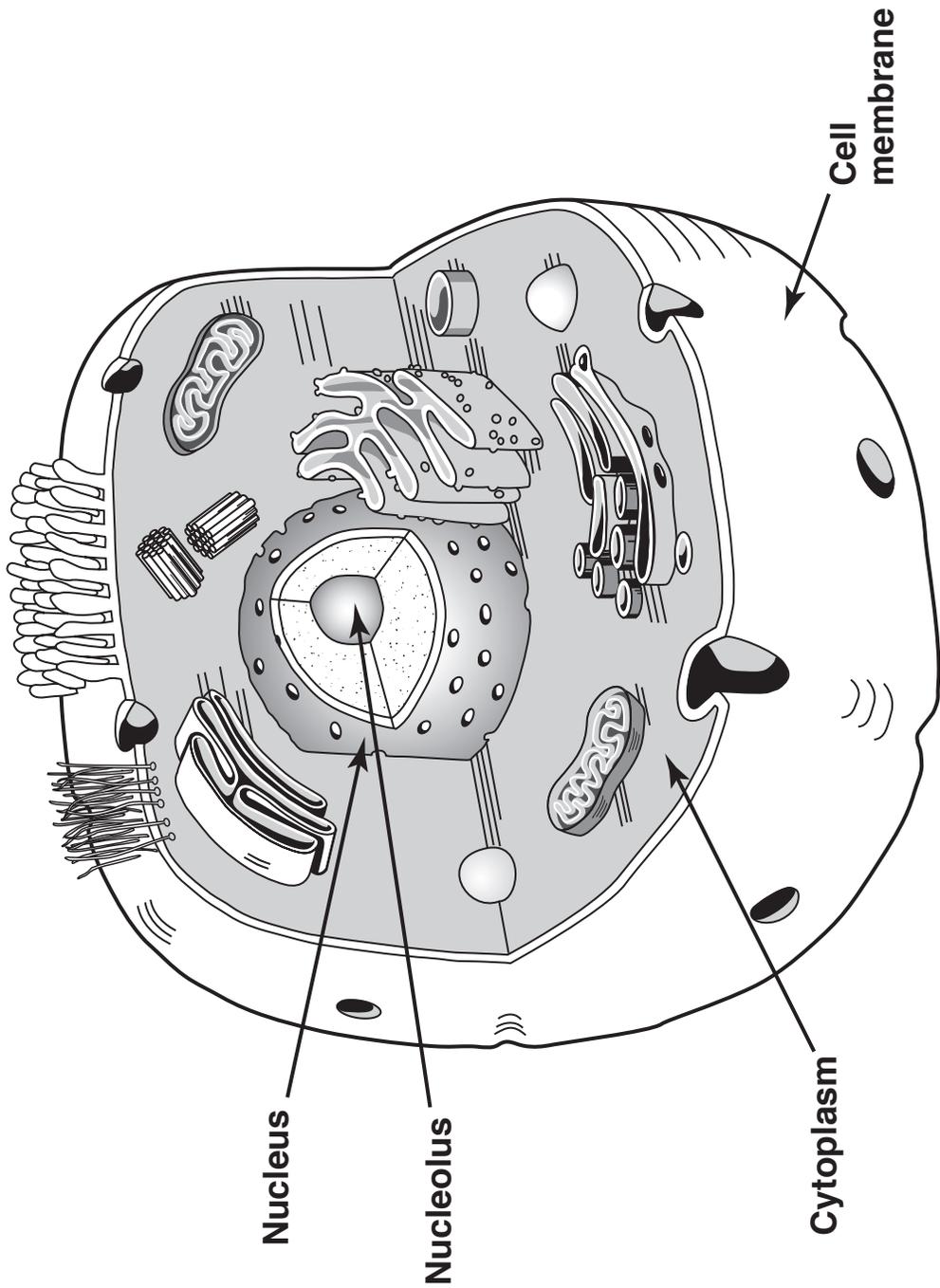
Answers to Written Test

Objective 18	<p>Answers should include any six of the following. Answers may appear in any order.</p> <ul style="list-style-type: none">a. To absorb materials to support cell functionsb. To metabolize nutrientsc. To metabolize oxygend. To release energye. To synthesize proteinf. To excrete waste productsg. To reproduce itselfh. To support functions specific to that kind of cell
Objective 19	<ul style="list-style-type: none">a. 4b. 6c. 2d. 5e. 1f. 3
Objective 20	<ul style="list-style-type: none">a. Bacillumb. Spirillumc. Coccus
Objective 21	<ul style="list-style-type: none">a. outer cell wallb. shape
Objective 22	<ul style="list-style-type: none">a. proteinb. shapec. reproduced. enzymese. typef. dormantg. medications
Objective 23	<p>a, b, d, e</p>
Objective 24	<ul style="list-style-type: none">a. nutrientsb. eggsc. body sitesd. licee. vectors

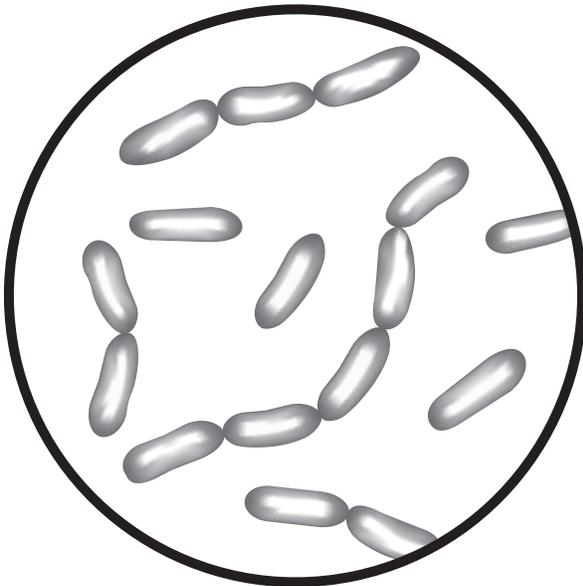
Parts of an Atom



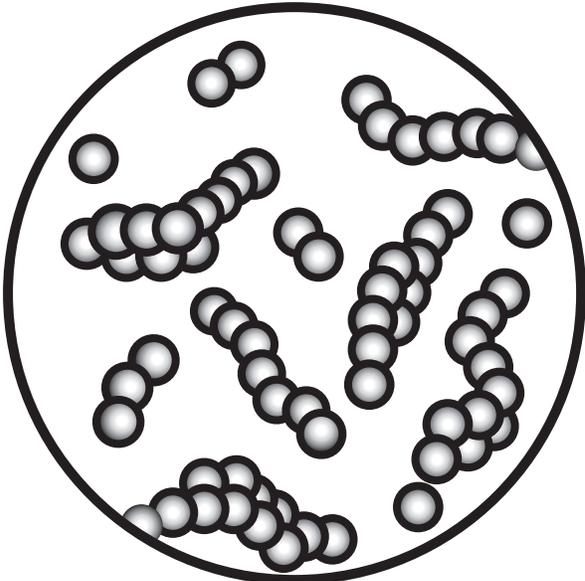
Major Parts of a Cell



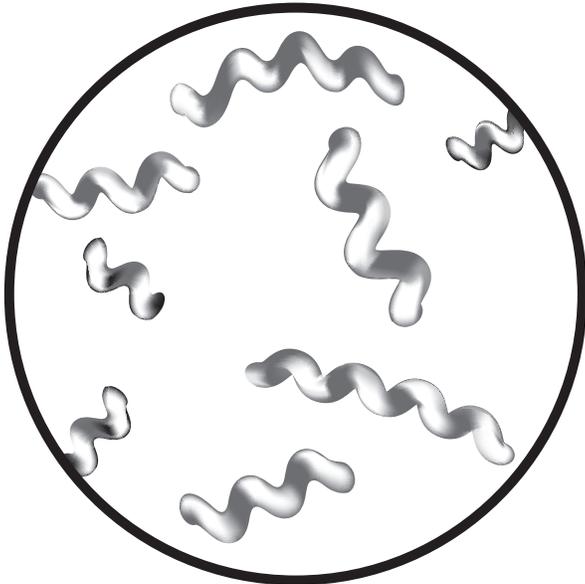
Classes of Microorganisms



Bacillum



Coccus



Spirillum

Module Contents

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	* Assignment Sheets are located in the Student Workbook.	

Suggested Activities

**Instructional
Plan**

Preparation

- Read the module carefully and plan for instruction.
- Review “Teaching Suggestions.” Plan for classroom activities.
- Plan your presentation to take advantage of student learning styles and to accommodate special-needs students.
- Prepare classroom. Put up posters and charts and display articles and other references related to this module.
- Obtain resources to supplement instruction of this module. See “Resources Used in Developing This Module” and “Suggested Supplemental Resources.”
- Review the “Suggested Web Sites,” and make a list of additional sites you may have found for students to research to learn more about infection, immunology, and sanitation.
- For self-paced instruction, review Learning Activities Sheet. Go to “customizable files” link on teacher edition CD and modify as appropriate to include additional activities and/or resources available in your classroom. Make one copy for each student.
- Make copies of any teacher supplements that you have created that will be provided for each student.
- Make transparencies from the transparency masters included in this module. These appear in teacher edition only. A PowerPoint® presentation of transparencies is located on the teacher edition CD.

Delivery and Application

Module Introduction (self-paced instruction)

- Refer student to Learning Activities Sheet and module of instruction located in student guide.
- Review module contents with student.
- Have the student complete the steps in the Learning Activities Sheet.

Module Introduction (group instruction)

- Provide students with the module of instruction in the student edition.
- Discuss module and specific objectives.

Suggested Activities

- Discuss the information sheet. Implement teaching plan to localize, supplement, and personalize the module. Reinforce basic academic and workplace skills when applicable.
- Discuss the assignment sheets. Review with students the criteria for evaluation of these activities.

Teaching Suggestions

- ✓ **Note:** This module has two primary purposes: to teach students about infections and the body's defense mechanisms and to provide information about what students can do to help prevent the spread of infections in their place of employment.
- Select one of the classroom literacy activities provided in Module 1, Teacher Supplement 1. Use with students to help them improve their literacy skills (reading, writing, speaking, listening, and thinking) and to learn new subject matter.
- Tailor your instruction about the spread of infections to those facilities in which your students are likely to work. Be sure to involve representatives from local salons and spas in your planning so that your instruction will accurately reflect current practices.
- Use crossword puzzle (Assignment Sheet 1) to help reinforce the terms presented in objectives 1 through 4.
- Ask students if any of them have ever had an infection and ask them to explain what they think an infection is. Guide them to an understanding of the definition used in your course. Use their range of experiences to help them understand the broad application of the term.
- Discuss the infection process and introduce concepts related to the spread of infection within a host. Relate terms like *incubation period* and *resistance* to experiences that the students have had, such as one member of their family getting a cold followed in the next few days of others getting or not getting colds. Use this opportunity to encourage students to help maintain their resistance through good diet, exercise, getting plenty of rest (instead of cramming for tests), and proper precautions, including frequent, thorough hand washing.
- Use crossword puzzle (Assignment Sheet 2) to help reinforce the terms presented in objectives 5 through 12.
- Discuss types of diseases that are specific to humans and ways to immunize oneself against common diseases.
- For Objective 8 through Objective 12, demonstrate physical and chemical methods of antimicrobial control. Discuss the effectiveness of each and relate the methods to specific precautions.

Suggested Activities

- To supplement Objective 12, have cosmetology professionals discuss their experiences with nosocomial infections. Role play some of the procedures to allow students to get a sense of improper techniques and a false sense of security.
- For Assignment Sheet 3, make arrangements for students to work with science class or health science class to grow bacteria and cultures in safe, monitored environment. One or more microscopes and slides will be needed for students to view results and report their findings.
- Use module review (Assignment Sheet 5) to assess student knowledge of infection, immunology, and sanitation.

Evaluation

- Make copies of the written test. Using the Word® file included on the teacher edition CD, add or modify test items as needed. The written test serves as both a pretest and posttest to assist in measuring each student's competency gains.
- Give and evaluate pretest. Modify lesson plan to include additional instruction for those areas where students were deficient.
- Evaluate the assignment sheets. Rate the student using the criteria listed on each assignment sheet. See Answers to Assignment Sheets for correct answers where applicable. If the student's performance is unacceptable, have the student review the appropriate materials and complete the assignment again.
- Give and evaluate the posttest.
- Meet individually with students to evaluate their progress through this module of instruction and indicate to them possible areas for improvement.
- Reteach and retest as required.

Resources Used in Developing This Module

Print Media

- *Anatomy and Physiology*. Stillwater, OK: Multistate Academic and Vocational Curriculum Consortium, Inc., 2002.
- Gray, Henry. *Gray's Anatomy*, 39th ed. New York: Mosby, 2004.
- Gylys, Barbara A., and Regina Masters. *Medical Terminology Simplified*, 3rd ed. Philadelphia: F.A. Davis Company, 2005.
- Scanlon, Valerie C. and Tina Sanders. *Essentials of Anatomy and Physiology*, 4th ed. Philadelphia: F.A. Davis Company, 2002.
- Thibodeau, Gary A., and Kevin T. Patton. *Anatomy and Physiology*, 5th ed. St. Louis: Mosby, 2002.

Suggested Activities

Suggested Supplemental Resources

Print Media

- *Basic Operator*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2006.
- *Basic Esthetician*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.
- *Basic Manicurist*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.

Suggested Web Sites

✓ **Note:** The following web sites offer general information about anatomy and physiology and generally cover more than one body system.

- opencourse.org/collaboratories/harveyproject

The Harvey Project is an international collaboration of educators, researchers, physicians, students, programmers, instructional designers, and graphic artists working together to build interactive, dynamic human physiology course materials on the World Wide Web. Materials produced by the Harvey Project are available free to educational institutions. The site is constantly updated and should be checked often and browsed for overall content. The address provided is for the home page. By clicking the WEB button, you will be taken to an index of links divided into categories such as general physiology and specific systems. The number of links in each category is indicated in parentheses after the topic.

- <http://www.innerbody.com/htm/body.html>

This site provides a great deal of information on the human body in fun, interactive formats. There is a great deal of emphasis on terminology and body parts.

- <http://www.ama-assn.org/ama/pub/category/7140.html>

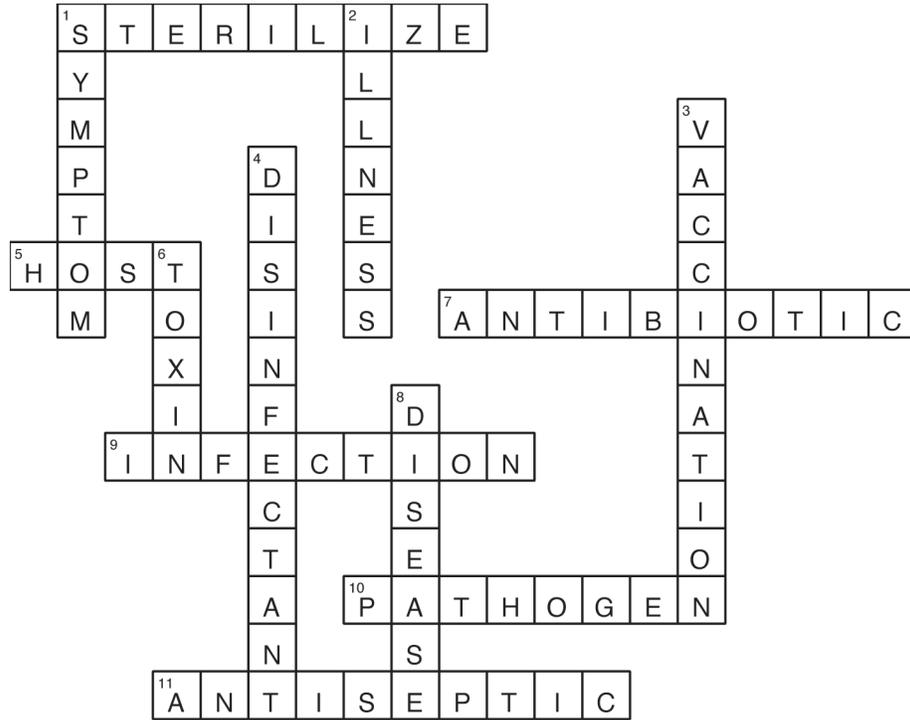
This site provides a wealth of information and many useful graphics about human anatomy.

✓ **Note:** Web-site addresses were accurate and all content on referenced web sites was appropriate during development and production of this product. However, web sites sometimes change; MAVCC takes no responsibility for a site's content. The inclusion of a web site does not constitute an endorsement of that site's other pages, products, or owners. You are encouraged to verify all web sites prior to use.

Answers to Assignment Sheets

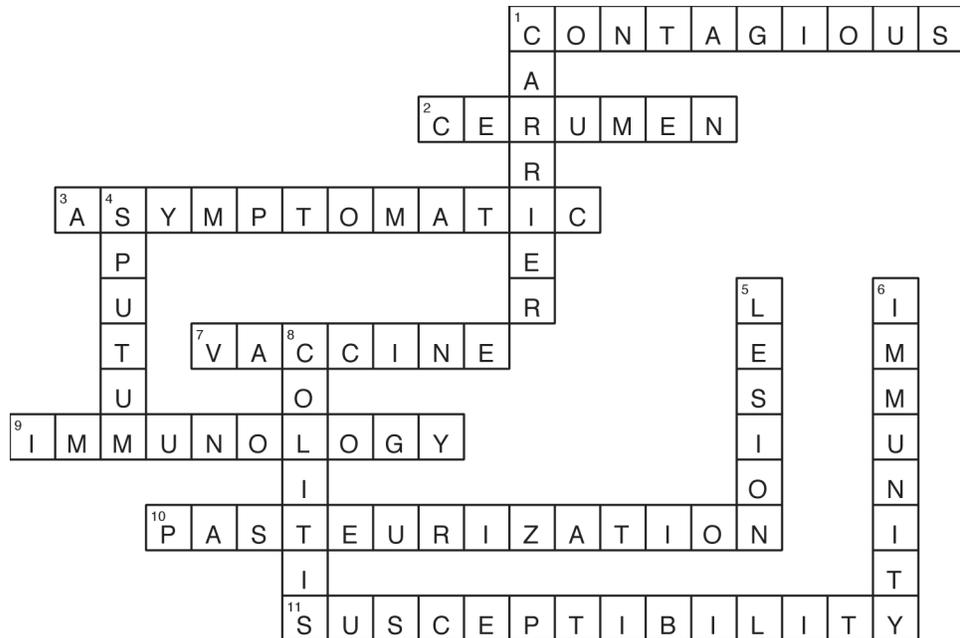
Assignment
Sheet 1

Complete the Crossword Puzzle of Terms (Objectives 1–4)



Assignment
Sheet 2

Complete the Crossword Puzzle of Terms (Objectives 5–12)



Answers to Assignment Sheets

Assignment Sheet 3

Conduct a Sanitation Inspection of the Salon/Laboratory and Classroom

This assignment to be evaluated by the instructor using the evaluation criteria stated on the assignment sheet.

Assignment Sheet 4

Analyze Cosmetology Scenarios

Answers should include key points but may be in the student's own words.

Answers to Scenario 1

Stay calm. Protect yourself from infection. Calm Ms. Leeman and explain the definition of a "host." Reassure her concerning the doctor's statement about her resistance and her good health. Try to determine what Ms. Leeman is carrying as a host.

Decision making—Depending on Ms. Leeman's explanation, inspect the area she has concern and whether it is an area you will come into contact with during the service.

Decision making—If there are no parasites, abrasions, open wounds, or pus present proceed with services.

Decision making—If parasites, abrasions, open wounds, or pus are present discontinue services.

Decision making—If you have concerns or doubts or are not fully convinced that Ms. Leeman is not contagious explain that services may hinder her healing. Ask her to follow the doctor's directions and return for services once the doctor clears her or abrasions have healed. Reassure her. Clean and sanitize all implements, capes and towels that come into contact, and clean and sanitize your hands.

Answers to Scenario 2

Stay calm. Ask the lady's name and her son's name. Ask for the doctor's name and telephone number. Call the doctor's office to verify the phone call. Protect yourself and other clients. If the phone call proves to be legitimate, make arrangements for an examination and immunization against meningitis for all stylists in the salon as soon as possible. Think back to during the time the young man was in the salon and whether he was in contact with other stylists or clients. Consult with a doctor to determine if other clients need to be called, but be cautious. Clean and sterilize the salon and bathroom areas.

Answers to Scenario 3

1. What should you do?

Stay calm. Protect yourself from the blood. Finish the service. Clean and sterilize all implements with an EPA-registered disinfectant labeled as effective against HIV, HBV, Hepatitis B, and clean and disinfect the salon and bathroom areas.

Answers to Assignment Sheets

Assignment Sheet 5

2. What is required for implements to be sterilized following coming into contact with blood or body fluids?

Clean each implement and submerge completely in an EPA-registered disinfectant for 15 minutes. Remove implements with tongs, gloves, or a draining basket. Rinse thoroughly and dry. Place disinfected implements in a clean, closed, dry, disinfected covered container.

3. What policy and standard brought about the requirement of using an EPA-registered disinfectant in the salon?

OSHA's Policy of 1997; OSHA's Bloodborne Pathogens Standard

Complete Module 3 Review

- | | |
|-------|-------|
| 1. c | 21. a |
| 2. d | 22. a |
| 3. c | 23. b |
| 4. b | 24. c |
| 5. c | 25. a |
| 6. c | 26. a |
| 7. d | 27. b |
| 8. b | 28. b |
| 9. b | 29. a |
| 10. d | 30. a |
| 11. d | 31. b |
| 12. c | 32. d |
| 13. b | 33. d |
| 14. d | 34. c |
| 15. c | 35. b |
| 16. b | 36. a |
| 17. d | 37. c |
| 18. c | 38. a |
| 19. d | 39. a |
| 20. c | 40. a |

Written Test

Name _____

Date _____ Score _____

Objective 1

Define the term *infection*. Write your answer on the blank lines provided beside the term below.

Infection _____

Objective 2

Complete statements that describe the effects of infection on a human host. Write your answers on the blank lines provided in the statements below.

- a. The harmful effects of an infection on a host may be the direct result of an action taken by a pathogen or the result of _____ produced by the pathogen.
- b. The ability of an infecting organism to harm a host is referred to as _____.
- c. The ability of a host to avoid infection and reduce harm caused by an infecting organism is called _____.
- d. An infection may result in observable _____ in a host, or the infection may occur without _____.
- e. The period of time between the incidence of infection and the appearance of symptoms in a host is referred to as the _____ period.
- f. An infection in a host may be _____, limited to only one organ or site, or it may be _____, affecting the entire body.
- g. The host's body produces special _____ that recognize pathogens and destroy them.
- h. _____ diseases are infections that can be spread from one human host to another through direct or indirect contact.

Written Test

Objective 3

Complete statements that describe methods used to reduce the spread of infection. Write your answers on the blank lines provided in the statements below.

- a. The spread of infection can be reduced by using _____ practices, cleaning with disinfectants, and sterilizing instruments and surgical materials.
- b. Some infections can be prevented through _____, the administration of a medication that increases the body's resistance to a specific pathogen.
- c. Once an infection has occurred, _____ can be used to improve the body's ability to fight the infection.

Objective 4

Match types of infections and diseases with their descriptions. Write the numbers on the blanks provided.

- | | |
|------------------------|-----------------------|
| 1. Acute infection | 4. Systemic infection |
| 2. Chronic infection | 5. Primary disease |
| 3. Localized infection | 6. Secondary disease |

- _____ a. An infection that has spread throughout a host's body from an initial site
- _____ b. The first-occurring infection within a period of illness
- _____ c. A subsequent infection or complication to an existing condition
- _____ d. An infection that lasts for a long period of time—from weeks to several years
- _____ e. An infection that involves only one organ or site of a host's body
- _____ f. An infection that runs a rapid and severe course and then ends abruptly

Objective 5

Complete statements that describe the role of the body's portals of entry and portals of exit in the spread of infectious diseases. Write your answers on the blank lines provided in the statements below and on the next page.

- a. The most-common portals of entry for pathogens are _____ in the skin and natural body openings such as the nose and mouth.
- b. The most-common portals of exit for pathogens are skin _____ and natural body openings such as the nose and mouth.
- c. Typically, a disease will spread from an infected host's portals of _____ to a second host's portals of _____.

Objective 6

d. Hosts who have recovered from a disease or who are asymptomatic may be _____ and transmit the disease to others.

e. _____ that live in the soil, on other surfaces, or in contaminated foods can also enter the body through portals of entry.

Match the body's physical barriers to infection with their functions. Write the numbers on the blanks provided.

- | | | |
|-----------------|-----------|------------|
| 1. Perspiration | 3. Saliva | 5. Cerumen |
| 2. Tears | 4. Mucus | |

_____ a. Provides a coating that prevents pathogens from contacting delicate areas of the skin in the ear canal

_____ b. Helps to cleanse the pores and raise the level of acidity on the skin

_____ c. Provides a coating that prevents pathogens from making direct contact with the skin

_____ d. Rid the eyes of contaminants and help to seal and lubricate the eyelids to prevent entry of organisms

_____ e. Contains enzymes that help break down invading pathogens and prevent them from colonizing in the mouth

Objective 7

Define the types of immunity. Write your answers on the blank lines provided beside each of the terms below.

a. Genetic immunity _____

b. Naturally acquired active immunity _____

c. Artificially acquired active immunity _____

Written Test

Objective 8

Match methods used to control the spread of microorganisms with their definitions. Write the numbers on the blanks provided.

- | | | |
|-----------------|------------------|-------------------|
| 1. Antiseptic | 3. Antibiotic | 5. Pasteurization |
| 2. Disinfectant | 4. Sterilization | |

- _____ a. A process that destroys pathogens on surfaces
- _____ b. A process of heating a food to destroy pathogens in the food
- _____ c. A chemical used to destroy or reduce the growth of pathogens on objects
- _____ d. A chemical used to treat bacterial infections
- _____ e. A chemical used to destroy or reduce the growth of pathogens on people

Objective 9

State reasons certain industries must control the growth of microorganisms. Write your answers on the blank lines beside each of the terms below.

- a. Public health _____

- b. Food preservation _____

- c. Production of sterile products _____

- d. Research _____

Objective 10

Match types of antimicrobial control methods with their descriptions. Write the numbers on the blanks provided. Definitions continue on the next page.

- | | | |
|---------------|-----------------|----------------------|
| 1. Antiseptic | 4. Disinfectant | 7. Moist heat |
| 2. Barrier | 5. Dry heat | 8. Pressurized steam |
| 3. Cold | 6. Drying | 9. Sterilant |

- _____ a. Physical method that will not generally kill microbes but is used to slow their growth
- _____ b. Physical method used to reduce the growth of fungi and some bacteria

- _____ c. Chemical method used to destroy all organisms on inanimate objects
- _____ d. Physical method used to prevent microbes from reaching portals of entry
- _____ e. Chemical method used to destroy bacteria on inanimate objects
- _____ f. Chemical method used to destroy bacteria on living organisms
- _____ g. Physical method used to kill microbes through the combined effect of heat and water that is at a temperature short of boiling
- _____ h. Physical method used to kill all microbes and their spores through the effects of an autoclave
- _____ i. Physical method used to kill microbes through the effects of heat from a source such as an oven or an infrared light

Objective 11

List factors that contribute to the spread of nosocomial infections. Write your answers on the blank lines provided below.

- a. _____
- b. _____
- c. _____
- d. _____

Written Test

Objective 12

Match organisms that cause common nosocomial infections with the infections they cause. Write the numbers on the blanks provided.

- | | |
|--------------------------|---------------------------------------|
| 1. Staphylococcus aureus | 4. Human immunodeficiency virus (HIV) |
| 2. Streptococcus species | 5. Hepatitis B virus |
| 3. Esherichia coli | 6. Human papilloma virus |

- _____ a. Involved in “strep” throat, scarlett fever, pneumonia, rheumatic heart disease, and other communicable conditions
- _____ b. Responsible for various infections referred to as *colitis*
- _____ c. Responsible for AIDS
- _____ d. Associated with several types of cancer, including cancers of the mouth and cervix
- _____ e. Responsible for hepatitis
- _____ f. Responsible for a number of post-operative infections commonly referred to as staph infections

***Permission to duplicate this test is granted.**

Answers to Written Test

- Objective 1** Infection—An invasion of a body by organisms and the reaction of the body to the presence of those organisms and to the toxins that they produce; the presence and multiplication of an organism that results in harm or disease to a host
- Objective 2** a. toxins
b. virulence
c. resistance
d. symptoms, symptoms
e. incubation
f. localized, systemic
g. cells
h. Communicable
- Objective 3** a. antiseptic
b. vaccinations
c. antibiotics
- Objective 4** a. 4
b. 5
c. 6
d. 2
e. 3
f. 1
- Objective 5** a. breaks
b. lesions
c. exit, entry
d. carriers
e. Pathogens
- Objective 6** a. 5
b. 1
c. 4
d. 2
e. 3

Answers to Written Test

Objective 7	<ul style="list-style-type: none">a. Genetic immunity—Immunity based on one’s inherited genetic makeup rather than on the production of antibodiesb. Naturally acquired active immunity—Long-term immunity acquired when a person contracts a disease and his or her body naturally produces antibodies in response to the pathogen and memory cells that protect that person from the pathogenc. Artificially acquired active immunity—Long-term immunity acquired when a person is given a vaccine and his or her body produces antibodies in response to the vaccine and memory cells that protect that person from the pathogen
Objective 8	<ul style="list-style-type: none">a. 4b. 5c. 2d. 3e. 1
Objective 9	<ul style="list-style-type: none">a. Public health—To prevent the spread of illnessb. Food preservation—To keep microorganisms from destroying food and to prevent the spread of disease through infected foodc. Production of sterile products—To prevent contamination of the products during the production processd. Research—To produce pathogens under controlled circumstances to gain better understanding of them and to develop vaccines and other control measures for them
Objective 10	<ul style="list-style-type: none">a. 3b. 6c. 9d. 2e. 4f. 1g. 7h. 8i. 5
Objective 11	Answers may be in any order. <ul style="list-style-type: none">a. Improper hand-washing techniquesb. Inappropriate use of antibioticsc. False sense of securityd. Employees
Objective 12	<ul style="list-style-type: none">a. 2b. 3c. 4d. 6e. 5f. 1

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	Transparency Masters	
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	Student Guide	
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	Module Objective Sheet 4–5	
	Information Sheet 4–7	
	Student Workbook	
* Assignment Sheets		
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	2—Develop a Presentation on Basic Tissue of the Human Body 55	
	3—Complete Module 4 Review 57	
* Assignment Sheets are located in the Student Workbook.		

Instructional
Plan**Suggested Activities****Preparation**

- Read the module carefully and plan for instruction.
- Review “Teaching Suggestions.” Plan for classroom activities.
- Plan your presentation to take advantage of student learning styles and to accommodate special-needs students.
- Prepare classroom. Put up posters and charts and display articles and other references related to this module.
- Obtain resources to supplement instruction of this module. See “Resources Used in Developing This Module” and “Suggested Supplemental Resources.”
- Review the “Suggested Web Sites,” and make a list of additional sites you may have found for students to research to learn more about the various types of tissue.
- For self-paced instruction, review Learning Activities Sheet. Go to “customizable files” link on teacher edition CD and modify as appropriate to include additional activities and/or resources available in your classroom. Make one copy for each student.
- Make copies of Teacher Supplement 1 and any teacher supplements that you have created that will be provided for each student.
- Make transparencies from the transparency masters included in this module. These appear in teacher edition only. A PowerPoint® presentation of transparencies is located on the teacher edition CD.

Delivery and Application

Module Introduction (self-paced instruction)

- Refer student to Learning Activities Sheet and module of instruction located in student guide.
- Review module contents with student.
- Have the student complete the steps in the Learning Activities Sheet.

Module Introduction (group instruction)

- Provide students with the module of instruction in the student edition.

Suggested Activities

- Discuss module and specific objectives.
- Discuss the information sheet. Implement teaching plan to localize, supplement, and personalize the module. Reinforce basic academic and workplace skills when applicable.
- Discuss the assignment sheets. Review with students the criteria for evaluation of these activities.

Teaching Suggestions

- ✓ **Note:** This module introduces students to the basic types of tissue in the human body.
- Use Teacher Supplement 1 with students to help them improve their literacy skills and to learn new subject matter.
- Use crossword puzzle (Assignment Sheet 1) to help reinforce terms in the associated objectives.
- Obtain slides of the various types of tissue and discuss the structures and anatomical location of each.
- Discuss a couple of organs, such as the heart or kidneys, and relate the statements in Objective 10 to the structure and function of the organ so that students can relate tissue functions to actual organs.
- Use module review (Assignment Sheet 3) to assess student knowledge of basic types of tissue and their functions.

Evaluation

- Make copies of the written test. Using the Word® file included on the teacher edition CD, add or modify test items as needed. The written test serves as both a pretest and posttest to assist in measuring each student's competency gains.
- Give and evaluate pretest. Modify lesson plan to include additional instruction for those areas where students were deficient.
- Evaluate the assignment sheets. Rate the student using the criteria listed on each assignment sheet. See Answers to Assignment Sheets for correct answers where applicable. If the student's performance is unacceptable, have the student review the appropriate materials and complete the assignment again.
- Give and evaluate the posttest.

Suggested Activities

Resources Used in Developing This Module

- Meet individually with students to evaluate their progress through this module of instruction and indicate to them possible areas for improvement.
- Reteach and retest as required.

Print Media

- *Anatomy and Physiology*. Stillwater, OK: Multistate Academic and Vocational Curriculum Consortium, Inc., 2002.
- Gray, Henry. *Gray's Anatomy*, 39th ed. New York: Mosby, 2004.
- Gyls, Barbara A., and Regina Masters. *Medical Terminology Simplified*, 3rd ed. Philadelphia: F.A. Davis Company, 2005.
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- *Basic Manicurist*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.
- Forget, Mark A. *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Victoria, British Columbia; Trafford Publishing, 2004.

Suggested Activities

Suggested Web Sites

✓ **Note:** The following web sites offer general information about anatomy and physiology and generally cover more than one body system.

opencourse.org/collaboratories/harveyproject

The Harvey Project is an international collaboration of educators, researchers, physicians, students, programmers, instructional designers, and graphic artists working together to build interactive, dynamic human physiology course materials on the World Wide Web. Materials produced by the Harvey Project are available free to educational institutions. The site is constantly updated and should be checked often and browsed for overall content. The address provided is for the home page. By clicking the WEB button, you will be taken to an index of links divided into categories such as general physiology and specific systems. The number of links in each category is indicated in parentheses after the topic.

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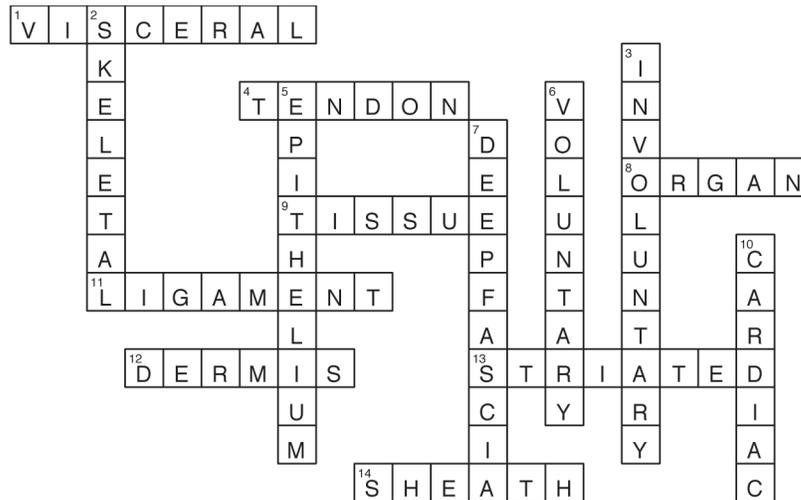
This site provides a wealth of information and many useful graphics about human anatomy.

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Answers to Assignment Sheets

Assignment Sheet 1

Complete the Crossword Puzzle of Terms (Objectives 1–10)



Assignment Sheet 2

Develop a Presentation on Basic Tissue of the Human Body

This assignment sheet to be evaluated by the instructor using the evaluation criteria stated on the assignment sheet.

Assignment Sheet 3

Complete Module 4 Review

- | | |
|---------|-------|
| 1. d | 18. b |
| 2. a, d | 19. c |
| 3. c | 20. d |
| 4. a | 21. d |
| 5. a | 22. b |
| 6. a | 23. a |
| 7. b | 24. d |
| 8. d | 25. a |
| 9. b | 26. a |
| 10. a | 27. d |
| 11. a | 28. c |
| 12. d | 29. c |
| 13. a | 30. c |
| 14. a | 31. a |
| 15. c | 32. a |
| 16. c | 33. b |
| 17. b | 34. c |

Written Test

Name _____

Date _____ Score _____

Objective 1

Define the term *tissue*. Write your answer on the blank lines provided beside the term below.

Tissue _____

Objective 2

Match the basic types of tissue with their descriptions. Write the numbers on the blanks provided.

- 1. Connective tissue
- 2. Epithelial tissue
- 3. Muscle tissue
- 4. Nerve tissue

_____ a. Tissue composed of fibers that are able to contract, causing and allowing movement of the parts and organs of the body

_____ b. Tissue consisting of one or more bundles of impulse-carrying fibers that connect the brain and the spinal cord with other parts of the body

_____ c. Tissue consisting of cells bound by connective material and varying in the number of layers and in the kinds of cells

_____ d. Dense tissue containing large numbers of cells and large amounts of intercellular material composed of fibers in a matrix or ground substance that may be liquid, gelatinous, or solid

Objective 3

State the functions of the basic types of tissue. Write your answers on the blank lines provided beside each of the terms below.

a. Epithelial tissue _____

b. Connective tissue _____

c. Muscle tissue _____

Written Test

Objective 4

d. Nerve tissue _____

Match the types of connective tissue with their functions. Write the numbers on the blanks provided.

- | | | |
|-------------------|---------------------|---------------------|
| 1. Adipose tissue | 3. Bone tissue | 5. Blood tissue |
| 2. Fibrous tissue | 4. Cartilage tissue | 6. Lymphatic tissue |

- _____ a. Located in the skeleton; forms bones to support the body and protect organs and tissues
- _____ b. Located in tendons, ligaments, deep fascia, dermis, and the kidneys; provides strong, flexible connections and the formation of scars
- _____ c. Located under the skin; provides padding, insulation, and a place to store fats
- _____ d. Located in the lymph nodes, spleen, tonsils, and thymus; forms certain types of white blood cells
- _____ e. Located throughout the blood system; transports materials, including oxygen, throughout the body and combats foreign organisms and cells
- _____ f. Located in the nose, ears, trachea, and eustachian tubes and at bone joints; provides a firm-but-not-rigid structure and padding between bones

Objective 5

Distinguish between the basic types of nerve tissue. Write an "NG" on the blank before the description of neuroglia.

- _____ a. The supporting- or connecting-tissue cells of the central nervous system
- _____ b. The basic nerve-tissue cells of the nervous system that are capable of generating electrochemical impulses that carry information to and from the brain

Objective 6

Match the basic parts of a neuron with their functions. Write the numbers on the blanks provided.

1. Axon 2. Dendrite 3. Cell body

- _____ a. Carries nervous-system impulses to the cell body
 _____ b. Performs metabolic and reproductive functions for the cell
 _____ c. Carries nervous-system impulses from the cell body

Objective 7

Complete statements that describe how neurons function in the nervous system. Write your answers on the blank lines provided in the statements below.

- a. Neurons are surrounded by specialized cells that form the _____, which electrically isolates neurons.
- b. The _____ of one neuron is separated from a _____ of an adjoining neuron by a space called a *synapse*.
- c. Nerve-system impulses cannot cross the synapse unless it is filled with special chemicals called _____.
- d. There are three kinds of neurons as determined by their location and function: _____, _____, and interneurons.
- e. _____ neurons, which are sometimes referred to as *afferent neurons*, carry signals from receptors in the skin, skeletal muscles, joints, and organs to the central nervous system.
- f. _____ neurons, which are sometimes referred to as *efferent neurons*, carry impulses from the central nervous system to effectors that cause responses in the muscles and glands.
- g. _____, which are located in the central nervous system, carry either sensory or motor impulses or connect motor and sensory neurons and support higher order functions such as thinking and learning.

Written Test

Objective 8

Describe the factors that determine muscle-tissue classifications. Write your answers on the blank lines provided beside each of the terms below.

- a. Structural composition _____

- b. Level of conscious control _____

- c. Location _____

Objective 9

Define the term *organ*. Write your answer on the blank lines provided beside the term below.

Organ _____

Objective 10

Complete statements that describe how organ systems function. Write your answers on the blank lines provided in the statements below.

- a. Organs are collections of _____ that are organized in such a way that they are able to perform specific functions.
- b. The overall goal of these functions is to maintain a state of _____ in the body.
- c. Each organ system monitors one or more conditions _____ to the body or in the body's _____ environment.
- d. The organs have feedback mechanisms that send signals to the _____ _____ _____ (CNS) about the conditions that they monitor.
- e. The CNS provides response signals to organs in order to actuate regulation mechanisms designed to return the body to _____.
- f. Many of the response mechanisms involve _____ or chemical reactions.
- g. Organs are also involved in the _____ of materials throughout the body.

*Permission to duplicate this test is granted.

Answers to Written Test

Objective 1	Tissue—A collection of cells that share a similar structure and are organized to perform a specific function
Objective 2	a. 3 b. 4 c. 2 d. 1
Objective 3	a. Epithelial tissue—Provides a protective barrier against extreme temperatures, environmental contaminants, and invasions by microorganisms while allowing secretion and excretion of wastes b. Connective tissue—Binds to other tissue structures to support and organize the body; binds to foreign cells to protect the body; binds to molecules to transport materials through the body c. Muscle tissue—Allows the movement of the movable structures of the body d. Nerve tissue—Conducts electrical signals through the body
Objective 4	a. 3 b. 2 c. 1 d. 6 e. 5 f. 4
Objective 5	a
Objective 6	a. 2 b. 3 c. 1
Objective 7	a. Sheath of Schwann b. axon; dendrite c. neurotransmitters d. sensory; motor e. Sensory f. Motor g. Interneurons

Answers to Written Test

Objective 8

- a. Structural composition—Whether the muscle tissue is striated or smooth (nonstriated)
- b. Level of conscious control—Whether the muscle is voluntary or involuntary
- c. Location—Whether the muscle tissue is skeletal, visceral, or cardiac

Objective 9

Organ—A structure consisting of two or more tissues that performs a specific function for the body

Objective 10

- a. tissues
- b. homeostasis
- c. internal, external
- d. central nervous system
- e. homeostasis
- f. physical
- g. transport

Teacher Supplement 1 – Complete an Anticipation Guide

Evaluation Criteria	Rating
• Completion of guide before reading	_____
• Review of completed guide after reading	_____
• Group participation and discussion	_____
• Classroom discussion	_____

Basic Skills



Directions Part 1

Before reading the materials provided and in the space to the left of each statement, place a check mark (✓) if you agree or think the statement is true.

- _____ 1. The study of tissue is known as "histology."
- _____ 2. Biological tissue is a collection of interconnected cells that perform a similar function within an organism.
- _____ 3. Tissue that covers organ surfaces such as the skin and inner lining of digestive tracts that serve for protection, secretion, and absorption is known as "epithelium."
- _____ 4. Bone and blood are connective tissues.
- _____ 5. Contractile tissue is characterized by the separation of the cells by an inorganic material.
- _____ 6. Connective tissue is characterized by the separation of the cells by an inorganic material.
- _____ 7. Muscle tissue is separated into three distinct categories: visceral or smooth; skeletal or rough muscles; and cardiac or heart muscle.
- _____ 8. Nervous tissue causes the person to shake.
- _____ 9. Cells that form the brain, spinal cord, and peripheral nervous system are called "nervous tissue."
- _____ 10. Connective tissue holds everything together.

Teacher Supplement 1

Directions Part 2

During or after reading: add a new check mark or cross through the check marks on those statements about which you have changed your mind. You may have to put some thought into your answers. This is not an assignment where you can hunt and find the answers verbatim in the materials. Use the space under each statement to note where you found the information to support your thinking.

✓ **Note:** You may find information in several locations to support your thinking. Be prepared to defend your answers.

Directions Part 3

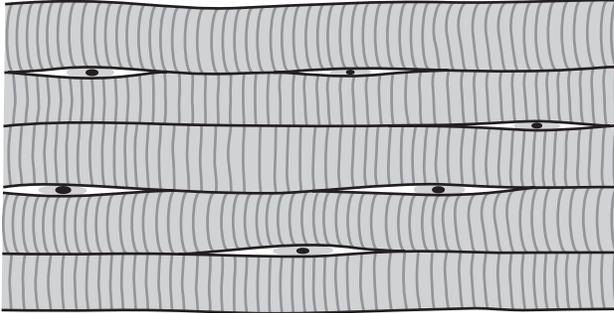
Join your team to defend your beliefs. Determine those statements that each member of the team believed to be a true statement. Using your notes written under each statement, discuss the statements that all members of the team did not agree were true and come to a group consensus.

Directions Part 4

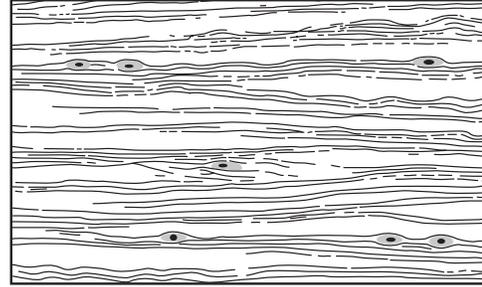
Share group results with the entire class as directed by the teacher.

Adapted from *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Mark A. Forget, Ph.D., ©2004.

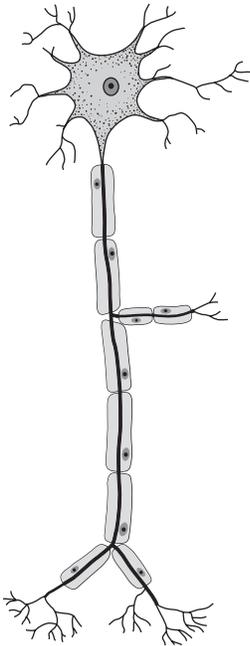
Basic Types of Tissue



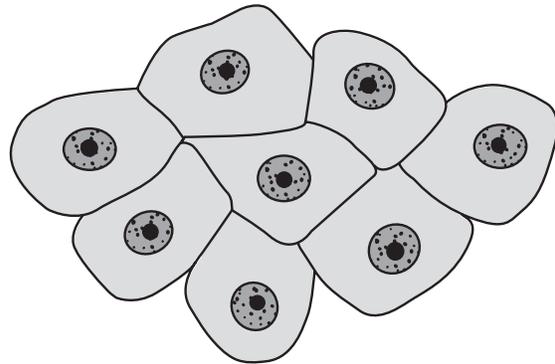
Muscle tissue
(skeletal muscle tissue)



Connective tissue
(fibrous tissue)

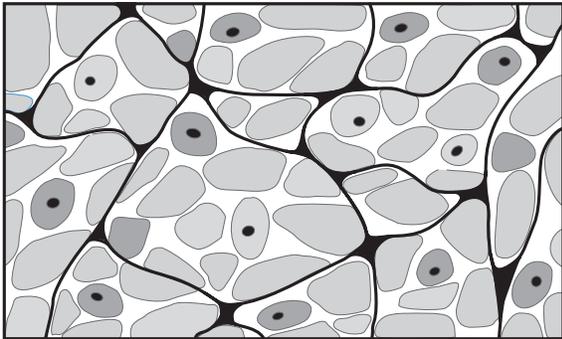


Nerve tissue
(neuron)

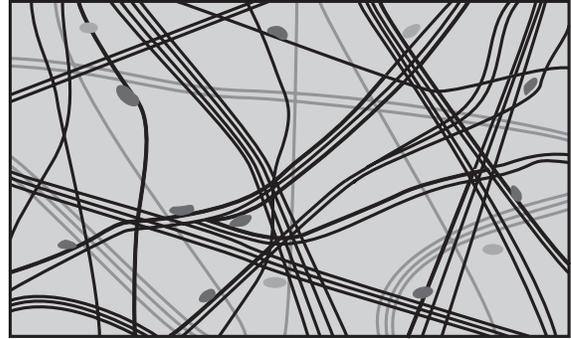


Epithelial tissue
(surface tissue)

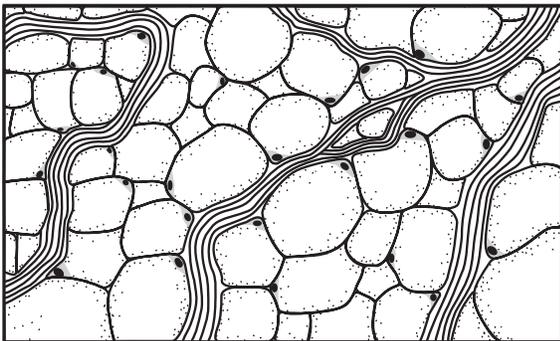
Types of Connective Tissue



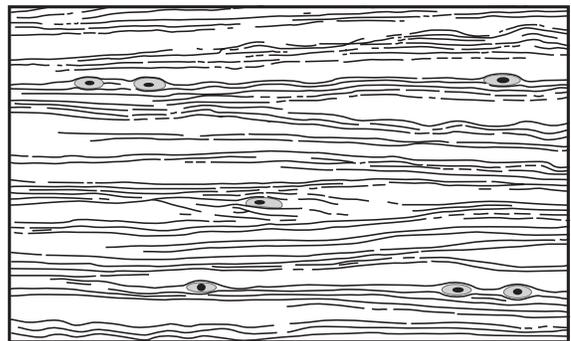
Reticular tissue



Areolar tissue



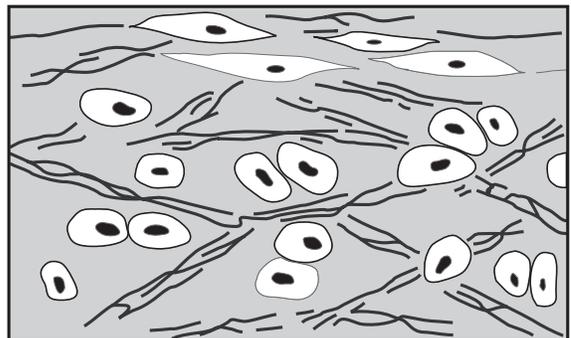
Adipose tissue



Fibrous tissue

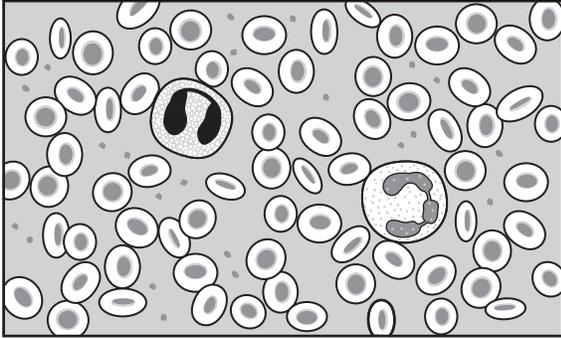


Bone tissue

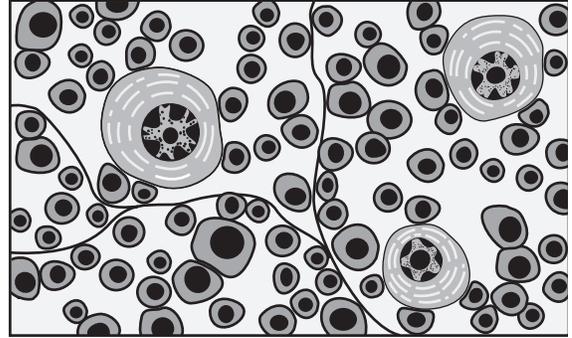


Cartilage tissue

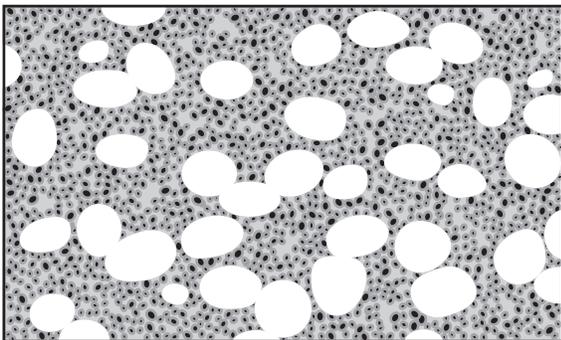
Types of Connective Tissue (cont.)



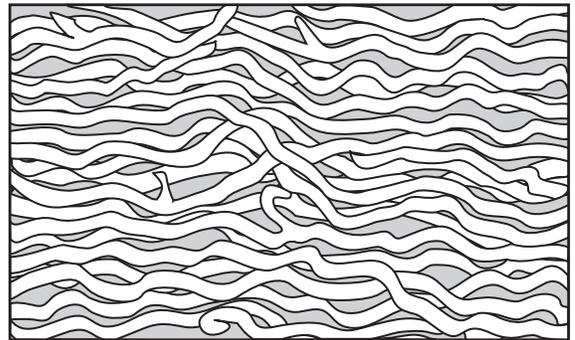
Blood tissue



Lymphatic tissue

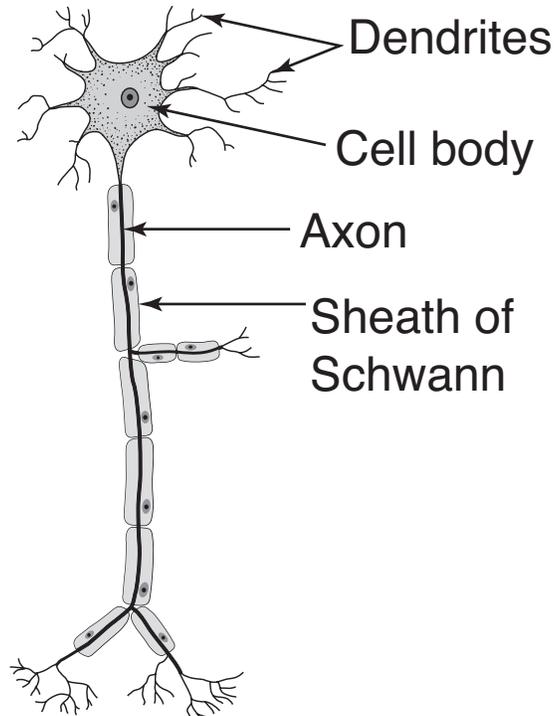


Myeloid tissue

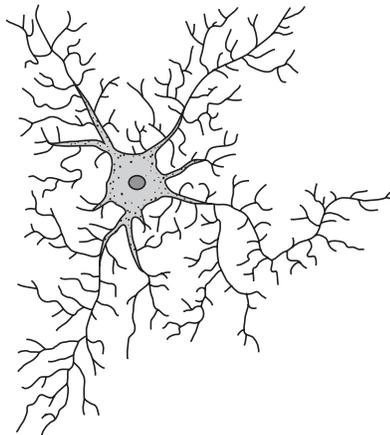


Elastic tissue

Basic Types of Nerve Tissue

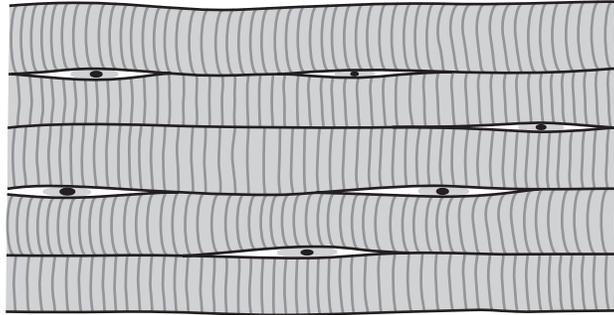


Neuron

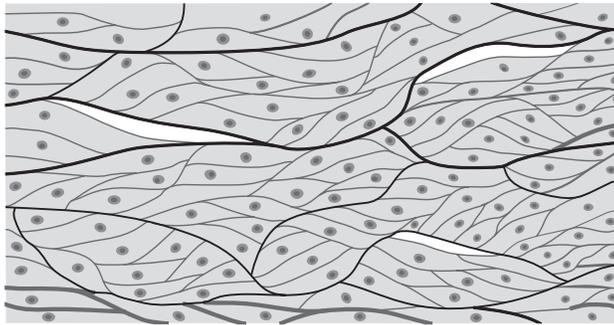


Neuroglia

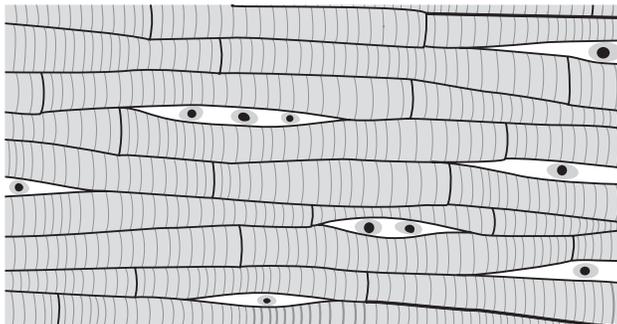
Types of Muscle Tissue



Skeletal muscle tissue
(striated tissue)



Visceral muscle tissue
(smooth tissue)



Cardiac muscle tissue
(striated tissue)

Module Contents

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	* Assignment Sheets are located in the Student Workbook.

Instructional Plan

Suggested Activities

Preparation

- Read the module carefully and plan for instruction.
- Review “Teaching Suggestions.” Plan for classroom activities.
- Plan your presentation to take advantage of student learning styles and to accommodate special-needs students.
- Prepare classroom. Put up posters and charts and display articles and other references related to this module.
- Obtain resources to supplement instruction of this module. See “Resources Used in Developing This Module” and “Suggested Supplemental Resources.”
- Review the “Suggested Web Sites,” and make a list of additional sites you may have found for students to research to learn more about the integumentary system.
- For self-paced instruction, review Learning Activities Sheet. Go to “customizable files” link on teacher edition CD and modify as appropriate to include additional activities and/or resources available in your classroom. Make one copy for each student.
- Make copies of Teacher Supplement 1 and any teacher supplements that you have created that will be provided for each student.
- Make transparencies from the transparency masters included in this module. These appear in teacher edition only. A PowerPoint® presentation of transparencies is located on the teacher edition CD.

Delivery and Application

Module Introduction (self-paced instruction)

- Refer student to Learning Activities Sheet and module of instruction located in student guide.
- Review module contents with student.
- Have the student complete the steps in the Learning Activities Sheet.

Module Introduction (group instruction)

- Provide students with module of instruction.

Suggested Activities

- Discuss module and specific objectives.
- Discuss the information sheet. Implement teaching plan to localize, supplement, and personalize the module. Reinforce basic academic and workplace skills when applicable.
- Discuss the assignment sheets. Review with students the criteria for evaluation of these activities.

Teaching Suggestions

- ✓ **Note:** This is the first module to deal with a specific body system. Use this module to introduce the study of body systems and let students know that the remaining modules will focus on a specific system or systems.
- To introduce this module, consider that many of your students may not have thought of the skin as an organ. Remind students that an organ is a structure consisting of more than one type of tissue and having a specific function. This definition will help to introduce the first five objectives, which define the integument, explain its functions, and describe its tissue structure. Encourage the students to consider the skin in terms of its functions relative to other organs and their functions. At this point, the students have not formally studied other organs, but they will be somewhat familiar with some of the more obvious, such as the heart. This approach may help the students realize that body systems are more complex than they have yet considered.
- Use Teacher Supplement 1 with students to help them improve their literacy skills and to learn new subject matter.
- Use crossword puzzle (Assignment Sheet 1) to help reinforce the terms in objectives 1 through 7.
- Use the following points to supplement your discussion of Objective 3, which describes the characteristics of the skin.
 - Discuss skin hygiene and how it influences health and the spread of disease. If not already done, demonstrate proper hand-washing techniques. Emphasize your facility's requirements for hand washing for various situations, such as after going to the restroom, eating lunch or snacks, and after working with clients with various conditions, such as head lice, nail fungus, or skin lesions.
 - Tell students that the skin is not just external; it provides coverage into the mouth, nose, ears, and other orifices connecting to mucous membranes.

Suggested Activities

- When discussing the fourth point in Objective 3, talk about blushing, the inflammatory response, and other factors that affect the flow of blood to the surface of the skin. Have each student squeeze the base of the little finger on one hand between the thumb and index finger of the other hand for 10 to 15 seconds and then release it. They should observe that the end of the finger is flush, and when they remove the compression, the compressed area should appear pale but then quickly return to normal color. Explain the role of blood in the skin's coloration. Also, discuss melanin and its effect on complexion. Have the students compare skin tones, freckling, etc., being careful not to allow judgmental assessments of skin color or pigmentation or blemishes.
- The major point of Objective 4, which lists the functions of the skin, is that the skin is a barrier to the outside world, but the barrier is selective. The skin allows certain substances to escape from the body to support waste elimination, body-temperature regulation, and other functions. However, the skin is also permeable to some chemicals that can be absorbed through the skin. Discuss the negative and positive aspects of this fact. Point out that breaks in the skin allow the entry of chemicals and microorganisms into the body that would not be able to penetrate intact skin.
- To supplement your discussion of Objective 5—the major structures of the skin—use slides if available to view skin tissues. Illustrate the sensitivity of skin by having students try to touch the epidermis lightly enough to prevent sensation in the dermis. Discuss factors that would lead to variations in the thickness and numbers of layers of skin.
- Use the following strategies when discussing Objective 6, which concerns the layers of the epidermis, and Objective 7, which concerns the layers of the dermis.
 - Some students may be able to flake off cells from the stratum corneum to illustrate that it is essentially dead cells. To help students understand the concept of layers within layers (such as stratum spinosum), have the students view a hard-bound book on end. Point out that the front cover, the pages, and the back cover can each be considered as a separate layer. At the same time, each page can be thought of as a layer within the “page layer.”

Suggested Activities

- It may be difficult for students to envision the ability of the papillary layer of the dermis to create the ridges of the fingerprints. Again, using a book for illustration, show a soft-cover book on end. Push a section of pages and a cover toward the middle of the book to show that a bulge in the pages layer causes a similar ridge in the outer cover layer. Continue the illustration by saying that similar effects are caused by the connection of muscles to the reticular layer of the dermis, which can be easily illustrated by wrinkling the forehead. Provide samples of leather as an illustration of the toughness of the dermis. Discuss the importance of collagen in skin growth and healing.
- Use crossword puzzle (Assignment Sheet 2) to help reinforce the terms presented in objectives 8 through 14.
- In association with Objective 8 through Objective 10, which define the term *auxiliary appendage* and discuss the hair and nails, allow students to study their skin under magnification and to look at one of their own hairs under a microscope. Then, ask the students to discuss the role of hair in humans. There is some value in cilia to move substances, in the eyelashes in protecting the eyes, and in head and facial hair for the protection of the cranium and preservation of heat in the head and on the face. Use this opportunity to discuss the role of the integumentary system in our appearance—hair styling, make-up, tanning, nail polish, etc. Discuss requirements of your facility in the care of hair and nails.

For Objective 9, have students discuss scalp and hair problems they have seen or had, such as dandruff or dry or oily hair. Discuss the importance of sanitation in the salon.
- For Objective 11, which states the functions of the glands located in the skin, discuss glands in a general way, reminding the students about earlier objectives related to the endocrine system. Point out that the glands in the skin are ducted glands. Discuss the importance of the glands in the integumentary system, their distribution over the body, and care of pores.

Suggested Activities

- Make the following points when discussing the types of nerve endings presented in Objective 12. At first, the difference in nerve sensations may not be apparent, so some demonstrations may be required to aid in students' understanding the distinctions. The sense of touch seems fairly obvious but probably is not fully understood by most students. Provide samples of a number of textures and substances—a cup of water, emery board, curler, glass, cloth, etc. Allow the students to feel the differences in the “feel” (touch) of these objects. Next, ask each student to place a thumb against the forearm of the opposite arm. Ask them to steadily increase the pressure of the thumb against the arm and be aware of the sensation. Demonstrate the sensation of temperatures using a warm (not hot) and cool (not cold) object. Using a candle and ice, demonstrate that they can sense temperatures from a distance and recognize relative differences in heat and cold. Use the discussion of pain to provide the students with a brief overview of the nervous system in terms of signals being sent by the skin receptors to the brain.
- Use the drawings in Objective 13 to help identify all the structures of the integument you have defined and discussed in the previous objectives in the Information Sheet.
- Invite a dermatologist to discuss the role of the integumentary system in personal appearance and discuss the importance of self-image to clients and their concern about skin conditions that they may consider to be unsightly and how these feelings may affect their self-esteem.
- Use crossword puzzle (Assignment Sheet 3) to help reinforce the terms presented in Objectives 15 and 16.
- Use crossword puzzle (Assignment Sheet 4) to help reinforce the terms presented in Objective 17.
- Discuss with students various types of graphic organizers and select a style for students to use in completing Assignment Sheet 5.
- For Assignment Sheet 6, prepare items using the principles of the Jeopardy game show.
- Use module review (Assignment Sheet 8) to assess student knowledge of the integumentary system.

Evaluation

- Make copies of the written test. Using the Word® file included on the teacher edition CD, add or modify test items as needed. The written test serves as both a pretest and posttest to assist in measuring each student's competency gains.
- Give and evaluate pretest. Modify lesson plan to include additional instruction for those areas where students were deficient.

Suggested Activities

Resources Used in Developing This Module

- Evaluate the assignment sheets. Rate the student using the criteria listed on each assignment sheet. See Answers to Assignment Sheets for correct answers where applicable. If the student's performance is unacceptable, have the student review the appropriate materials and complete the assignment again.
- Give and evaluate the posttest.
- Meet individually with students to evaluate their progress through this module of instruction and indicate to them possible areas for improvement.
- Reteach and retest as required.

Print Media

- *Anatomy and Physiology*. Stillwater, OK: Multistate Academic and Vocational Curriculum Consortium, Inc., 2002.
- Gray, Henry. *Gray's Anatomy*, 39th ed. New York: Mosby, 2004.
- Gyls, Barbara A., and Regina Masters. *Medical Terminology Simplified*, 3rd ed. Philadelphia: F.A. Davis Company, 2005.
- Scanlon, Valerie C. and Tina Sanders. *Essentials of Anatomy and Physiology*, 4th ed. Philadelphia: F.A. Davis Company, 2002.
- Thibodeau, Gary A., and Kevin T. Patton. *Anatomy and Physiology*, 5th ed. St. Louis: Mosby, 2002.

Suggested Supplemental Resources

Print Media

- *Basic Operator*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2006.
- *Basic Esthetician*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.
- *Basic Manicurist*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.
- Forget, Mark A. *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Victoria, British Columbia; Trafford Publishing, 2004.

Suggested Activities

Suggested Web Sites

✓ **Note:** The following web sites offer general information about anatomy and physiology and generally cover more than one body system.

- opencourse.org/collaboratories/harveyproject

The Harvey Project is an international collaboration of educators, researchers, physicians, students, programmers, instructional designers, and graphic artists working together to build interactive, dynamic human physiology course materials on the World Wide Web. Materials produced by the Harvey Project are available free to educational institutions. The site is constantly updated and should be checked often and browsed for overall content. The address provided is for the home page. By clicking the WEB button, you will be taken to an index of links divided into categories such as general physiology and specific systems. The number of links in each category is indicated in parentheses after the topic.

- <http://www.innerbody.com/htm/body.html>

This site provides a great deal of information on the human body in fun, interactive formats. There is a great deal of emphasis on terminology and body parts.

- <http://www.ama-assn.org/ama/pub/category/7140.html>

This site provides a wealth of information and many useful graphics about human anatomy.

- <http://www.skinsite.com>

This site provides information and graphics on the various skin diseases and treatments.

- <http://www.m-w.com>

This site is the Merriam-Webster online dictionary and provides students with an opportunity to both see and hear pronunciations for medical terms in addition to standard terms. It is a great "free" resource to reinforce the terminology presented in this module as well as subsequent modules that address the body systems.

- <http://en.wikipedia.org/wiki/integumentarysystem>

This site provides great information on the various body systems that make up the human body. To move from one body system to another, simply change the system name in the Web address. For example, change "integumentary" to "muscular" to go to the section of this on-line encyclopedia that addresses that system.

Suggested Activities

- <http://dir.yahoo.com/science/biology/anatomy>

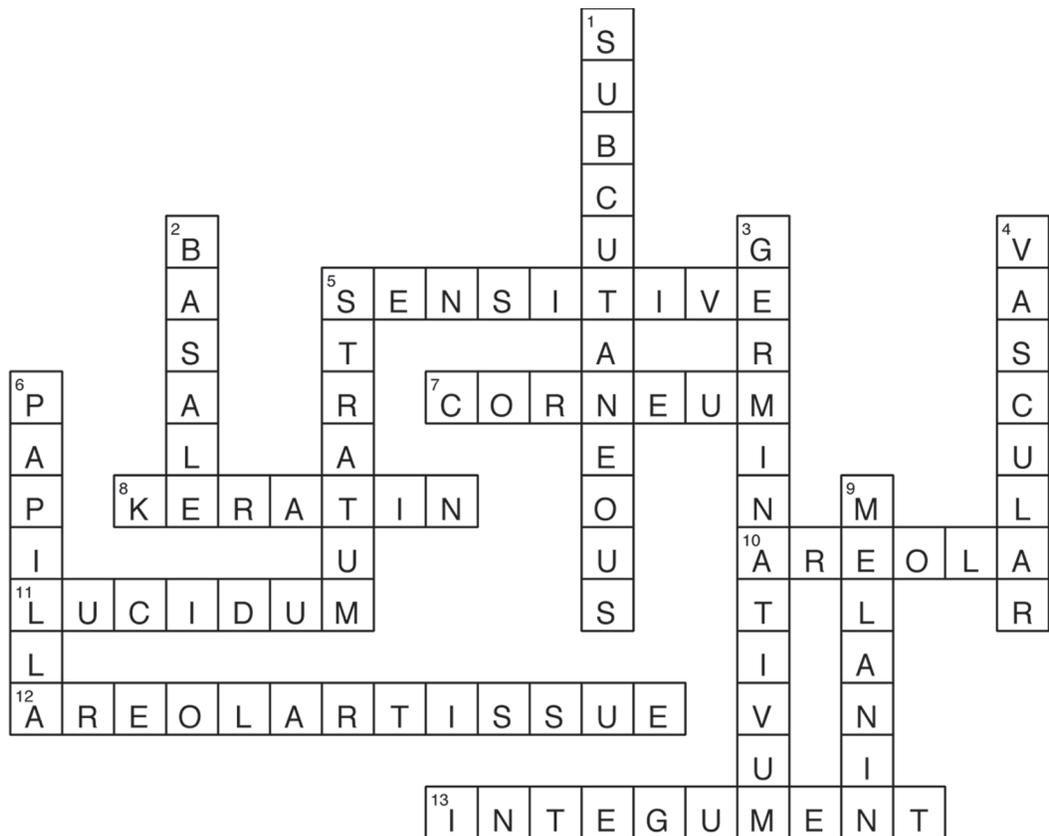
By going to this site, you will have access to a variety of Web addresses that cover the body systems in the human anatomy. Click on the body system you wish to explore to access Web sites that offer good information as well as illustrations to further explore the human body.

- ✓ **Note:** Web-site addresses were accurate and all content on referenced web sites was appropriate during development and production of this product. However, web sites sometimes change; MAVCC takes no responsibility for a site's content. The inclusion of a web site does not constitute an endorsement of that site's other pages, products, or owners. You are encouraged to verify all web sites prior to use.

Answers to Assignment Sheets

Assignment Sheet 1

Complete the Crossword Puzzle of Terms (Objectives 1–7)



Answers to Assignment Sheets

Assignment Sheet 4

Complete the Crossword Puzzle of Terms (Objective 17)

1 O	2 P		3 O	N	Y	C	H	4 O	R	R	H	E	X	I	S										
N	5 A	G	N	A	I	L		N																	
Y	R							6 P	T	E	R	Y	G	I	U	M									
C	O		7 O					C																	
H	N		N					H																	
8 O	N	Y	C	H	O	P	H	Y	M	A	9 M	O	L	D		10 O									
M	C							C				P				N									
Y	H							H				H				Y									
C	I							11 O	N	Y	C	H	I	A		C									
O	A							G				G				H									
S		12 O						R			13 O	N	Y	C	H	O	M	A	L	I	A				
I		N						Y													U				
S	14 O	N	Y	C	H	O	P	H	O	S	I	S									X				
T	N							O													I				
I	Y	H						S						15 C											
17 O	N	Y	C	H	O	L	Y	S	I	S				16 F	U	R	R	O	W	S					
E	H	C						S						R											
A	O	Y												R											
U	P	A												U											
N	T	N									18 L	E	U	K	O	N	Y	C	H	I	A				
G	O	O												T											
I	S	S									19 O	N	Y	C	H	A	T	R	O	P	H	I	A		
U	I	I																				O			
M	S	S																				N			
											20 O	N	Y	C	H	O	C	R	Y	P	T	O	S	I	S

Assignment Sheet 5

Create a Graphic Organizer

This assignment sheet to be evaluated by the instructor using the evaluation criteria stated on the assignment sheet.

Assignment Sheet 6

Review the Layers, Structures, and Glands of the Skin

This assignment should be evaluated by the instructor using the evaluation criteria stated on the assignment sheet.

Answers to Assignment Sheets

Assignment Sheet 7

Analyze Cosmetology Scenarios

Answers should include key points but may be in the student's own words.

Answers to Scenario 1

1. What type of cysts does Mr. Eagle have on his scalp?

Sebaceous cysts

2. What characteristic of the hair is involved? Sebaceous glands

3. What causes this characteristic?

Over active sebaceous gland

4. What should you do?

Let Mr. Eagle know that the lumps are sebaceous cysts and not contagious. Use care in combing or brushing the scalp so as not to aggravate the cysts and continue as usual with services.

Answers to Scenario 2

1. What is the technical term for infection of the fold of skin surrounding the nail?

Paronychia

2. What is the technical term for the condition of the nail separating from the nail bed?

Onycholysis

3. What is the common cause of the nail separating from the nail bed?

Stress, internal disorder, trauma to the nail, infection, nail fungi or allergy to nail enhancement products

4. What should you do?

Stay calm. Give Mr. Eagle the technical term associated with the redness, swelling and pus present on his fingers. Explain that the infection could spread to other fingers. Give Mr. Eagle the technical term, onycholysis, associated with the nail separating from the nail bed; refer him to a physician. Clean and sanitize your hands, implements and materials that came into contact with the infected fingers.

Answers to Assignment Sheets

Assignment Sheet 8

Answers to Scenario 3

1. Define pus.

Pus is an accumulation of white blood cells, pathogens, dead or damaged cells, and other substances associated with an infection.

2. Define pustule.

A pustule is an elevation of skin filled with pus.

3. What is a common cause of pustules on the neck?

Shaving the hair too close from the neck causing an ingrown hair, which may create a pus-forming abnormality

4. What do you do?

Stay calm. Inform Mr. Sebastian that he has a pustule on his neck.

Decision making—If the pustule is not open, ask if he is allergic to alcohol: If not, you may apply directly to the pustule. Continue with the service.

Decision making—If the pustule is draining pus, refer Mr. Sebastian to a physician. Clean and sanitize your hands.

Complete Module 5 Review

- | | | |
|-------|-------|-------|
| 1. d | 23. b | 45. a |
| 2. a | 24. b | 46. d |
| 3. b | 25. c | 47. c |
| 4. a | 26. a | 48. c |
| 5. b | 27. b | 49. a |
| 6. d | 28. d | 50. b |
| 7. b | 29. c | 51. a |
| 8. d | 30. b | 52. a |
| 9. c | 31. d | 53. c |
| 10. a | 32. d | 54. c |
| 11. d | 33. a | 55. d |
| 12. b | 34. c | 56. b |
| 13. b | 35. b | 57. c |
| 14. c | 36. b | 58. c |
| 15. c | 37. a | 59. d |
| 16. b | 38. a | 60. a |
| 17. d | 39. a | 61. b |
| 18. c | 40. d | 62. b |
| 19. c | 41. c | 63. c |
| 20. d | 42. d | 64. c |
| 21. d | 43. a | 65. a |
| 22. a | 44. b | |

Written Test

Name _____

Date _____ Score _____

Objective 1

Define the term *integument*. Write your answer on the blank lines provided beside the term below.

Integument _____

Objective 2

List the major structures that make up the integument. Write your answers on the blank lines provided below.

a. _____

b. _____

Objective 3

Complete statements that describe the characteristics of the skin. Write your answers on the blank lines provided in the statements below.

a. The skin is the largest _____ of the body.

b. Skin varies in _____ over the body.

c. If skin is kept clean, it is the body's first line of defense against _____.

d. Skin color is the result of _____ and the amount of blood near the surface of the skin.

Objective 4

Select from the following list functions of the skin. Place an "X" on the blank next to each correct function.

_____ a. Excretes waste materials

_____ b. Maintains a state of homeostasis in the body

_____ c. Provides a mechanical barrier against microorganisms, sunlight, and chemicals to protect the body

_____ d. Helps to regulate body temperature

Written Test

Objective 5

- _____ e. Houses nerve endings that sense pain, temperature, touch, and pressure
- _____ f. Monitors one or more conditions external to the body
- _____ g. Helps maintain fluid and electrolyte balance

Match major structures of the skin with their descriptions. Write the numbers on the blanks provided.

- | | |
|--------------|-----------------------------|
| 1. Epidermis | 3 Dermal-epidermal junction |
| 2. Dermis | 4. Hypodermis |

- _____ a. The thick, vascular, sensitive layer of the skin just below the epidermis, consisting of dense, fibrous connective tissue and containing the auxiliary appendage of the skin
- _____ b. The layer of areolar tissue and fat that exhibits varying amounts of fat content depending on factors such as body location, gender, nutrition, and health
- _____ c. A gel with fibrous structures that serve as a cement to hold the layers of the skin together
- _____ d. The thin, nonvascular, nonsensitive outermost layer of the skin, consisting of stratified squamous epithelial tissue and including as the greater part of its thickness dead cells that are scraped off and replaced by the underlying cells

Objective 6

Match the layers of the epidermis with their descriptions. Write the numbers on the blanks provided.

- | | |
|--------------------|-------------------------|
| 1. Stratum corneum | 3. Stratum germinativum |
| 2. Stratum lucidum | |

- _____ a. The water-repellent, transparent inner layer of the epidermis found only on the palms of the hands and the soles of the feet
- _____ b. The outermost layer of the epidermis where dead cells have been converted into keratin that continually flakes off
- _____ c. The innermost layer of the epidermis where columnar cells continually undergo mitosis to make new cells and push older cells outward

Objective 7

Distinguish between the layers of the dermis. Write an “R” on the blank line provided before the description of the reticular layer.

- _____ a. The inner layer of the dermis that forms a network of interlacing cells and fibers, making this layer tough and elastic
- _____ b. The outer layer of the dermis that lies next to the basal layer of the epidermis and is patterned with papillae and hollows

Objective 8

Define the term *auxiliary appendage*. Write your answer on the blank lines provided beside the term below.

Auxiliary appendage _____

Objective 9

Complete statements that describe the characteristics of hair. Write your answers on the blank lines provided in the statements below.

- a. Hair grows from a _____ in the skin; at the base is a bundle of stratum germinativum cells known as the germinal matrix; a _____ papilla joins the germinal matrix with capillaries that support the mitosis of the germinal-matrix cells.
- b. _____ muscles are attached to the follicles.
- c. A hair consists of a part that protrudes from the skin—called the _____—and a subdermal section—called the _____.
- d. Hair color results from _____ within the shaft.
- e. Hair is kept soft by _____ that is secreted by two or more sebaceous glands.
- f. Hair is found on all outer parts of the body except the penis and the _____ areas of the hands and feet.
- g. Hair on humans has little practical function except for the eyelashes, nasal hairs, and hair on the ears, all of which provide some level of protection against _____ and foreign matter.
- h. Hair grows approximately _____ inch per month.

Written Test

Objective 10

Complete statements that describe the characteristics of nails. Write your answers on the blank lines provided in the statements below.

- a. Nails generally are smooth, curved, and unspotted and are firmly attached to the _____.
- b. Nails consist of epidermal cells that have been converted to _____.
- c. Nails grow from epithelial cells lying under the _____ at the proximal end of a nail.
- d. Nails grow an average of _____ of an inch per month.
- e. The region under a nail is called the _____ area (nail bed).
- f. The skin surrounding a nail is called the _____.

Objective 11

Distinguish between the functions of glands located in the skin. Write "SE" on the blank next to the description of sebaceous glands.

- _____ a. Help to maintain homeostasis of fluids and electrolytes and body temperature; excrete nitrogenous wastes
- _____ b. Secrete sebum to lubricate and soften hair shafts; prevent excessive water evaporation and water absorption through the skin; lessen the amount of heat lost through the skin

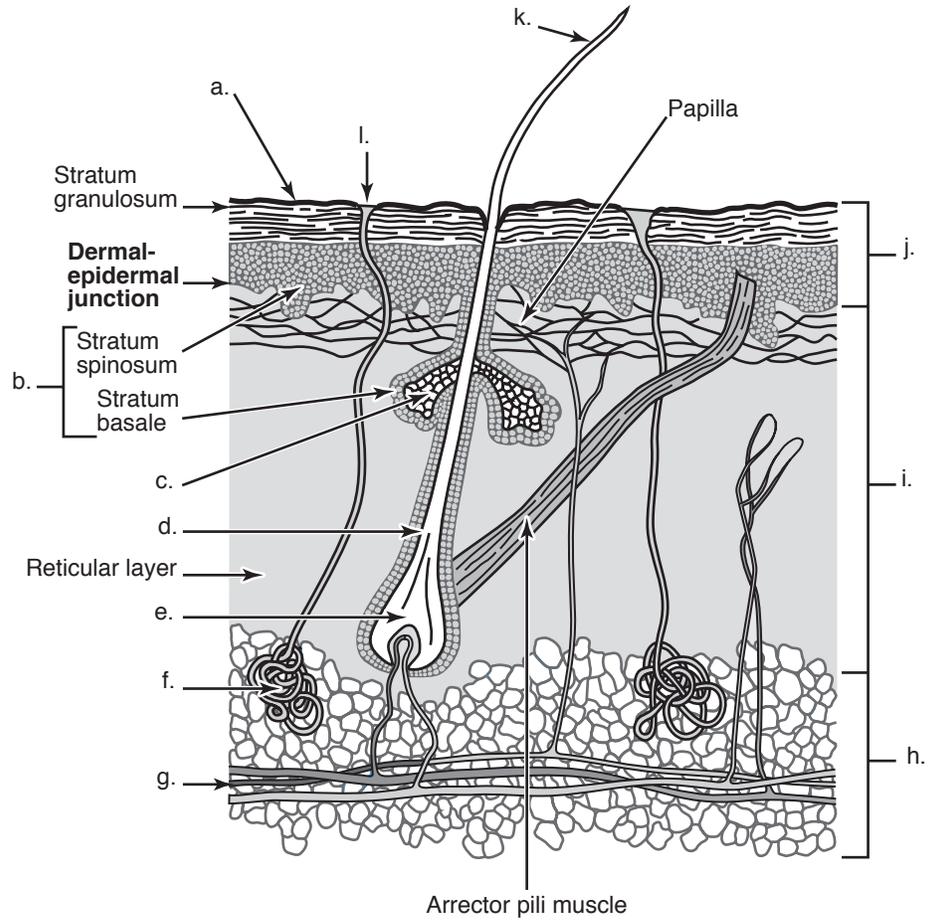
Objective 12

List the types of nerve endings found in the skin. Write your answers on the blank lines provided below.

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____

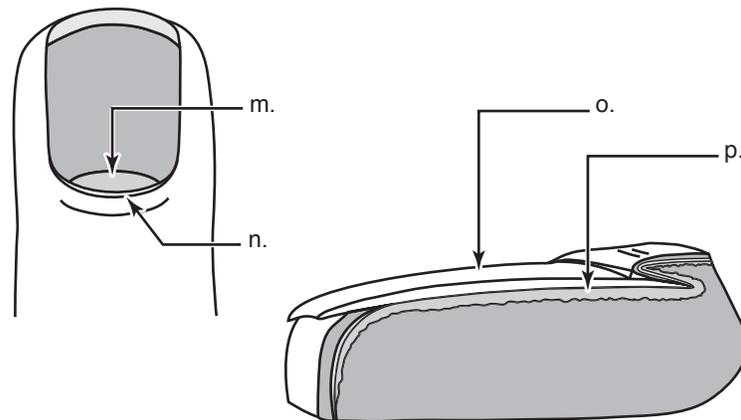
Objective 13

Label the major structures of the integument. Write your answers on the blank lines provided below each of the following illustrations.



- | | |
|----------|----------|
| a. _____ | g. _____ |
| b. _____ | h. _____ |
| c. _____ | i. _____ |
| d. _____ | j. _____ |
| e. _____ | k. _____ |
| f. _____ | l. _____ |

Written Test



m. _____

o. _____

n. _____

p. _____

Objective 14

Match common disorders and diseases of the scalp and hair with their definitions. Write the numbers on the blanks provided. Definitions continue on the next page.

- | | |
|-------------------------|--------------------------|
| 1. Alopecia areata | 9. Pediculosis capitis |
| 2. Alopecia prematura | 10. Pili incarnati |
| 3. Alopecia senilis | 11. Pityriasis |
| 4. Alopecia universalis | 12. Trichoptilosis |
| 5. Albinism | 13. Trichorrhexis nodosa |
| 6. Canities | 14. Trichosis |
| 7. Hypertrichosis | 15. Tinea capitis |
| 8. Monilethrix | |

_____ a. Grey hair

_____ b. Head lice

_____ c. Bald patches, usually caused by body disorders

_____ d. Ringworm caused by a vegetable parasite

_____ e. Condition characterized by the lack of pigment and normally affects eyes, skin and hair

_____ f. Beaded hair

_____ g. Split ends

_____ h. Ingrown hair

_____ i. Hair loss early in life (before middle age)

Objective 15

- _____ j. Hair loss later in life (after middle age)
- _____ k. Excessive hair growth
- _____ l. Hair loss over the body
- _____ m. Knotted hair
- _____ n. Small white flakes appearing on hair or scalp
- _____ o. Any diseased condition of the hair

Match common disorders and diseases of the sebaceous glands with their definitions. Write the numbers on the blanks provided. Definitions continue on the next page.

- | | | |
|--------------|-------------|---------------|
| 1. Acne | 6. Furuncle | 11. Pustule |
| 2. Carbuncle | 7. Hive | 12. Rosacea |
| 3. Comedones | 8. Keloid | 13. Seborrhea |
| 4. Cyst | 9. Milium | 14. Ulcer |
| 5. Fissure | 10. Polyp | 15. Vesicle |

- _____ a. An inflammatory lesion on the skin that may contain pus
- _____ b. Thick scar resulting from excessive growth of fibroid tissue
- _____ c. A growth that extends into the cavity of a mucous membrane or appears on the skin
- _____ d. A blister
- _____ e. An inflammation and infection of the dermis and subcutaneous tissue caused by bacteria that enter the skin through a hair follicle; a boil
- _____ f. Whitehead; small whitish mass in the epidermis, due to retention of sebum
- _____ g. A sac that contains any fluid substance other than pus
- _____ h. Crack or break in the skin; found on hands, heels, and chapped lips
- _____ i. A suddenly appearing raised patch that is usually redder than the surrounding skin; is often accompanied by severe itching; and is usually caused by an allergic reaction, infection, or stress
- _____ j. A painful, pus-producing infection above and below the skin; can infect hair follicles

Written Test

Objective 16

- _____ k. An infection and inflammation of the sebaceous glands
- _____ l. An elevation of skin filled with pus
- _____ m. Blackheads; mass of hardened sebum in the hair follicle
- _____ n. Congestion appearing primarily on the cheeks and nose, characterized by redness, dilation of blood vessels, and the formation of papules and pustules
- _____ o. Overactivity of the sebaceous glands; usually produces shiny appearance on the nose and forehead

Match common disorders and diseases of the skin with their definitions. Write the numbers on the blanks provided.

- | | | |
|-------------------|-------------------|----------------|
| 1. Dermatitis | 4. Psoriasis | 7. Tinea pedis |
| 2. Eczema | 5. Verruca | |
| 3. Herpes simplex | 6. Tinea corporis | |

- _____ a. Medical term for athlete's foot or ringworm; a fungal infection of the foot
- _____ b. Inflammatory, painful disease of the skin; characteristics may include both dry or moist lesions
- _____ c. A wart that is caused by a virus and may be contagious; also known as "Plantar Warts"
- _____ d. Inflammatory condition of the skin
- _____ e. Fever blisters or cold sores found on the lips or nostrils; caused by a virus; characterized by red, swollen, raised vesicles
- _____ f. Commonly known as ringworm; highly contagious fungal infection that can affect the skin, scalp or the nails
- _____ g. Skin disease characterized by red patches, covered with white-silver scales; rarely occurs on the face but is found on the scalp, elbows, knees, chest, and lower back

Objective 17

Match common disorders and diseases of the hands and nails with their definitions. Write the numbers on the blanks provided. Definitions continue on the next page.

Disorders

- | | | |
|-----------------|--------------------|--------------------|
| 1. Agnail | 5. Onychatrophia | 9. Onychomalialia |
| 2. Corrugations | 6. Onychauxix | 10. Onychophagy |
| 3. Furrows | 7. Onychocryptosis | 11. Onychorrhhexis |
| 4. Leukonychia | 8. Onychocyanosis | 12. Pterygium |

- _____ a. Depressions in the nail
- _____ b. Split cuticle that may become infected and bleed
- _____ c. Nervous habit which causes individual to chew the nail
- _____ d. Forward growth of the cuticle which adheres to the base of the nail
- _____ e. Wavy ridges on the nail
- _____ f. White spots in the nail; caused by tiny air bubbles in the nail or by the presence of incompletely keratinized cells due to an injury to the nail base
- _____ g. Split and brittle nail; caused by improper filing, excessive use of cuticle solvents and nail polish remover, or injury to the finger
- _____ h. Wasting away of the nail; caused by injury to the nail matrix or disease
- _____ i. Condition caused by poor blood circulation or heart disorder
- _____ j. Ingrown nails; may affect either finger or toe
- _____ k. Overgrowth or thickening of the nail plate
- _____ l. Thin nails caused by chronic illness, nerve disorder, or a systemic disturbance

Written Test

Diseases

- | | | |
|-------------------|------------------|-----------------|
| 1. Mold | 5. Onychomycosis | 8. Onychoptosis |
| 2. Onychia | tinea unguium | 9. Paronychia |
| 3. Onychogryposis | 6. Onychophosis | |
| 4. Onycholysis | 7. Onychophyma | |

- _____ a. Periodic shedding of part or all of nail
- _____ b. Pertains to enlarged and increased curvature of the nail
- _____ c. Fungal infection caused by trapped moisture; green spot under artificial nail or polish on natural nail
- _____ d. Infectious and inflammatory condition of tissue surrounding nail
- _____ e. Swelling of the nail
- _____ f. Inflammation of the nail matrix, accompanied by pus formation
- _____ g. Growth of horny epithelium in the nail bed
- _____ h. Ringworm of the nail; caused by a vegetable parasite
- _____ i. Loosening of nail without shedding

***Permission to duplicate this test is granted.**

Answers to Written Test

Objective 1	Integument—The structures that cover the exposed surfaces of the body
Objective 2	<ul style="list-style-type: none"> a. Skin b. Auxiliary appendages
Objective 3	<ul style="list-style-type: none"> a. organ b. depth c. disease d. melanin
Objective 4	a, c, d, e, g
Objective 5	<ul style="list-style-type: none"> a. 2 b. 4 c. 3 d. 1
Objective 6	<ul style="list-style-type: none"> a. 2 b. 1 c. 3
Objective 7	a. R
Objective 8	Auxiliary appendage—A formation of specialized cells within the skin that performs a particular function
Objective 9	<ul style="list-style-type: none"> a. follicle; dermal b. Arrector pili c. shaft; root d. pigment e. sebum f. contact g. dust h. 1/2
Objective 10	<ul style="list-style-type: none"> a. nail bed b. keratin c. lunula d. one-eighth e. subungual f. cuticle
Objective 11	b. SE

Answers to Written Test

Objective 12

Answers may appear in any order.

- a. Touch
- b. Pressure
- c. Heat
- d. Cold
- e. Pain

Objective 13

- a. Stratum corneum
- b. Stratum germinativum
- c. Sebaceous gland
- d. Hair follicle
- e. Hair root
- f. Sweat gland
- g. Nerve
- h. Hypodermis
- i. Dermis
- j. Epidermis
- k. Hair shaft
- l. Pore
- m. Lunula
- n. Cuticle
- o. Nail
- p. Subungual area

Objective 14

- a. 6
- b. 9
- c. 1
- d. 15
- e. 5
- f. 8
- g. 12
- h. 10
- i. 2
- j. 3
- k. 7
- l. 4
- m. 13
- n. 11
- o. 14

Answers to Written Test

Objective 15	a.	14
	b.	8
	c.	10
	d.	15
	e.	6
	f.	9
	g.	4
	h.	5
	i.	7
	j.	2
	k.	1
	l.	11
	m.	3
	n.	12
	o.	13

Objective 16	a.	7
	b.	2
	c.	5
	d.	1
	e.	3
	f.	6
	g.	4

Objective 17	Disorders	
	a.	3
	b.	1
	c.	10
	d.	12
	e.	2
	f.	4
	g.	11
	h.	5
	i.	8
	j.	7
	k.	6
	l.	9
	Diseases	
	a.	8
	b.	3
	c.	1
	d.	9
	e.	7
	f.	2
g.	6	
h.	5	
i.	4	

Teacher Supplement 1 – Complete an Anticipation Guide

Evaluation Criteria	Rating
• Completion of guide before reading	_____
• Review of completed guide after reading	_____
• Group participation and discussion	_____
• Classroom discussion	_____

Basic Skills



Directions Part 1

Before reading the materials provided and in the space to the left of each statement, place a check mark (✓) if you agree or think the statement is true.

- _____ 1. The epidermis, dermis, hypodermis, hair and nails make up the integumentary system.
- _____ 2. Thickness, defense against disease, subcutaneous tissue, and color are characteristics of the skin.
- _____ 3. Skin is thickest on the palms, soles of the feet and forehead.
- _____ 4. The cosmetologist normally treats two layers of skin.
- _____ 5. The germinativum is the layer where cells are developing and feeds cells to the other layers of the skin. As cells move upward to the surface of the skin, cells die and are sloughed off by the epidermis.
- _____ 6. The skin is water-repellent but moisture can be absorbed at the same time.
- _____ 7. Arrector pili muscles control the growth of the hair.
- _____ 8. Sebaceous and sweat glands, empty into the hair follicle an oily secretion that is antibacterial and antifungal.
- _____ 9. Hair color results from pigments in the blood.
- _____ 10. Hair growth may be affected by inherited characteristics, such as nutrition, hormones, and generally good health.

Teacher Supplement 1

Directions Part 2

During or after reading: add a new check mark or cross through the check marks on those statements about which you have changed your mind. You may have to put some thought into your answers. This is not an assignment where you can hunt and find the answers verbatim in the materials. Use the space under each statement to note where you found the information to support your thinking.

✓ **Note:** You may find information in several locations to support your thinking. Be prepared to defend your answers.

Directions Part 3

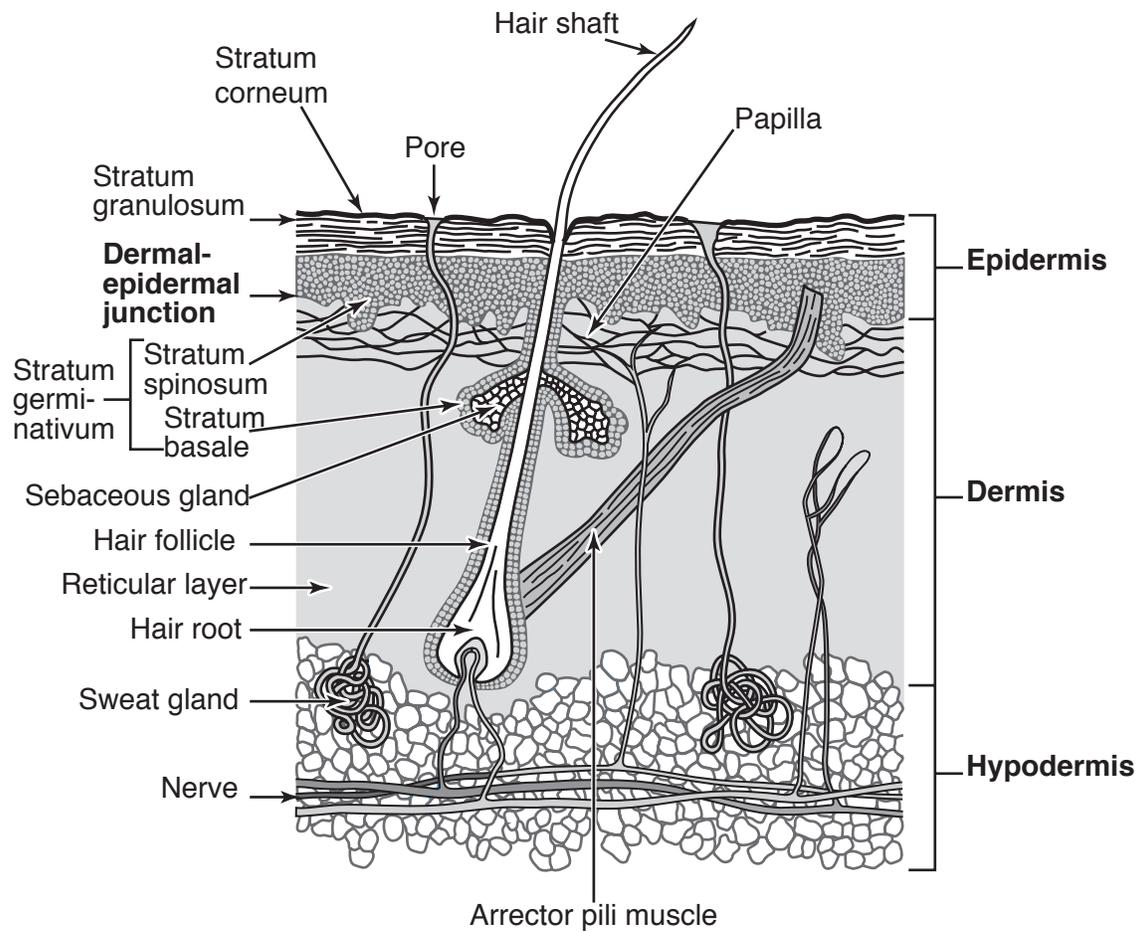
Join your team to defend your beliefs. Determine those statements that each member of the team believed to be a true statement. Using your notes written under each statement, discuss the statements that all members of the team did not agree were true and come to a group consensus.

Directions Part 4

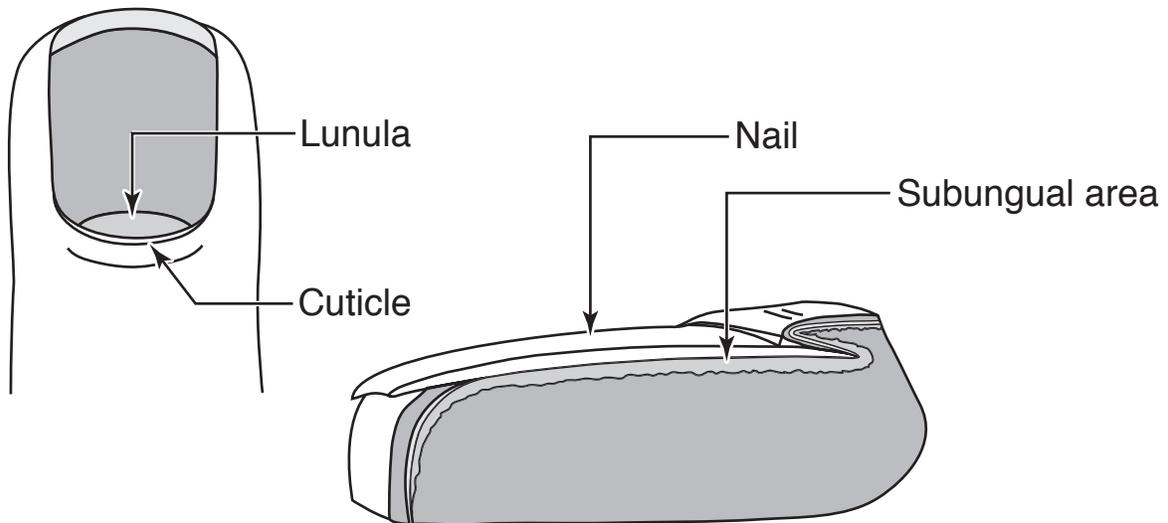
Share group results with the entire class as directed by the teacher.

Adapted from *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Mark A. Forget, Ph.D., ©2004.

Major Structures of the Integument



Major Structures of the Integument (cont.)



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* Assignment Sheets are located in the Student Workbook.		

Instructional
Plan**Suggested Activities****Preparation**

- Read the module carefully and plan for instruction.
- Review “Teaching Suggestions.” Plan for classroom activities.
- Plan your presentation to take advantage of student learning styles and to accommodate special-needs students.
- Prepare classroom. Put up posters and charts and display articles and other references related to this module.
- Obtain resources to supplement instruction of this module. See “Resources Used in Developing This Module” and “Suggested Supplemental Resources.”
- Review the “Suggested Web Sites,” and make a list of additional sites you may have found for students to research to learn more about the skeletal system.
- For self-paced instruction, review Learning Activities Sheet. Go to “customizable files” link on teacher edition CD and modify as appropriate to include additional activities and/or resources available in your classroom. Make one copy for each student.
- Make copies of any teacher supplements that you have created that will be provided for each student.
- Make transparencies from the transparency masters included in this module. These appear in teacher edition only. A PowerPoint® presentation of transparencies is located on the teacher edition CD.

Delivery and Application

Unit Introduction (self-paced instruction)

- Refer student to Learning Activities Sheet and module of instruction located in student guide.
- Review module contents with student.
- Have the student complete the steps in the Learning Activities Sheet.

Unit Introduction (group instruction)

- Provide students with module of instruction.

Suggested Activities

- Discuss module and specific objectives.
- Discuss the information sheet. Implement teaching plan to localize, supplement, and personalize the module. Reinforce basic academic and workplace skills when applicable.
- Discuss the assignment sheets. Review with students the criteria for evaluation of these activities.

Teaching Suggestions

- ✓ **Note:** The skeletal system is distinct enough that many students will be somewhat familiar with it at a basic level, recognizing major bones much as they would recognize the shapes and locations of certain sites on a U.S. map. Use this knowledge to introduce the module and bolster the confidence of the class by using a model or illustration to allow the students to name bones that they recognize.
- Select one of the classroom literacy activities provided in Module 1, Teacher Supplement 1. Use with students to help them improve their literary skills and to learn new subject matter.
- Use crossword puzzle (Assignment Sheet 1) to help reinforce the terms in objectives 1 through 6.
- Use skeletal models or other illustrations to play a game in which the students name bones of the skeletal system. One idea for individual play would be to use a *Who Wants to Be a Millionaire* format, where students get so many points (dollars) for correct answers, until the entire class has had an opportunity to accumulate points. Alternatively, the class can be divided into teams. *Family Feud* and *College Bowl* formats work well for this competition so that team members can confer on some questions. In these and other approaches, you may choose to draw the names of bones at random to avoid the appearance of prejudices, using multiple pools of names to account for differences in difficulty. Also, you may choose to provide the students with the name and have them identify the bone on the illustration or model or point to a bone and have the student supply the name or use a combination of these techniques.
- To supplement Objective 1 and Objective 2, which define the term skeletal system and state the functions of the skeletal system, use a model or illustrations of the skeletal system to demonstrate the functions of the skeletal system. Show students how connected parts move. Indicate the locations of organs to show how they are protected.
- For Objective 3, indicate the location and names of the various types of bones as classified by their location and structure. Relate structures to the purpose of each type of bone, such as how short bones provide flexibility while long bones provide rigidity and power.

Suggested Activities

- For Objective 5, use Transparency 1 to show the major components of the axial skeleton.
- For Objective 5 and Objective 6, which describe the major divisions of the human skeleton and the major bones of the anterior and posterior appendicular skeleton, explain to the students that the 206 bones of the human skeleton are divided into two subsystems. Use an illustration or model with the two subsystems colored with two different colors to distinguish between them. Provide the students with names of bones and have them state whether they are in the axial or appendicular skeleton.
- Use crossword puzzle (Assignment Sheet 2) to help reinforce the terms presented in objectives 7 through 13.
- Provide the students with illustrations or models to discuss the bones of the cranium and face as presented in Objective 7 and Objective 8. Discuss how the skull is constructed to support its functions, to include protection of the brain and operational support of the eyes, nose, ears, mouth, etc.
- Use Assignment Sheet 3 to assess student knowledge of the bones of the cranium.
- For Objective 8, have students locate their facial bones, to the extent possible. Use Assignment Sheet 4 to assess student knowledge of facial bones.
- When discussing Objective 10 and Objective 11, which deal with the major regions and the major bones of the vertebral column, compare and contrast types of vertebrae. Help the students understand the designations given to the vertebrae. Allow the students to explore spinal-column components to discover how they fit together, range of motion, protection of the spinal cord, etc. Indicate the fused components.
- Discuss the structure of the ribs and sternum, as presented in Objective 12 and Objective 13. Ensure that students understand the numbering of the ribs and how the ribs join or do not join the sternum and each other.
- Use module review (Assignment Sheet 6) to assess student knowledge of the skeletal system.

Evaluation

- Make copies of the written test. Using the Word® file included on the teacher edition CD, add or modify test items as needed. The written test serves as both a pretest and posttest to assist in measuring each student's competency gains.
- Give and evaluate pretest. Modify lesson plan to include additional instruction for those areas where students were deficient.

Suggested Activities

Resources Used in Developing This Module

- Evaluate the assignment sheets. Rate the student using the criteria listed on each assignment sheet. See Answers to Assignment Sheets for correct answers where applicable. If the student's performance is unacceptable, have the student review the appropriate materials and complete the assignment again.
- Give and evaluate the posttest.
- Meet individually with students to evaluate their progress through this module of instruction and indicate to them possible areas for improvement.
- Reteach and retest as required.

Print Media

- *Anatomy and Physiology*. Stillwater, OK: Multistate Academic and Vocational Curriculum Consortium, Inc., 2002.
- Gray, Henry. *Gray's Anatomy*, 39th ed. New York: Mosby, 2004.
- Gyls, Barbara A., and Regina Masters. *Medical Terminology Simplified*, 3rd ed. Philadelphia: F.A. Davis Company, 2005.
- Scanlon, Valerie C. and Tina Sanders. *Essentials of Anatomy and Physiology*, 4th ed. Philadelphia: F.A. Davis Company, 2002.
- Thibodeau, Gary A., and Kevin T. Patton. *Anatomy and Physiology*, 5th ed. St. Louis: Mosby, 2002.

Suggested Supplemental Resources

Print Media

- *Basic Operator*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2006.
- *Basic Esthetician*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.
- *Basic Manicurist*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.

Suggested Activities

Suggested Web Sites

✓ **Note:** The following web sites offer general information about anatomy and physiology and generally cover more than one body system.

- <http://hsorrel.humboldt.edu/~bioman/bones/bones.html>

The site provides interactive illustrations of the skeleton that allow students to view a skeleton without the bones labeled and then be able to click on one section at a time to see the bones labeled. This approach would be useful in self-study, in quizzing students, and in allowing students to drill each other.

- <http://www.innerbody.com/html/body.html>

This site features an interactive skeleton that shows labeling of select bones and articular components.

- <http://www.scoi.com>

This site provides information and illustrations of various skeletal regions with emphasis on joints.

- <http://www.csuchico.edu/anth/Module/skull.html>

The skull and its bones are the topic of this site. The presentation is interactive and includes a number of formats including animation.

- <http://www.ama-assn.org/ama/pub/category/7140.html>

This site provides a wealth of information and many useful graphics about human anatomy.

- <http://en.wikipedia.org/wiki/integumentarysystem>

This site provides great information on the various body systems that make up the human body. To move from one body system to another, simply change the system name in the Web address. For example, change "integumentary" to "muscular" to go to the section of this on-line encyclopedia that addresses that system.

- <http://dir.yahoo.com/science/biology/anatomy>

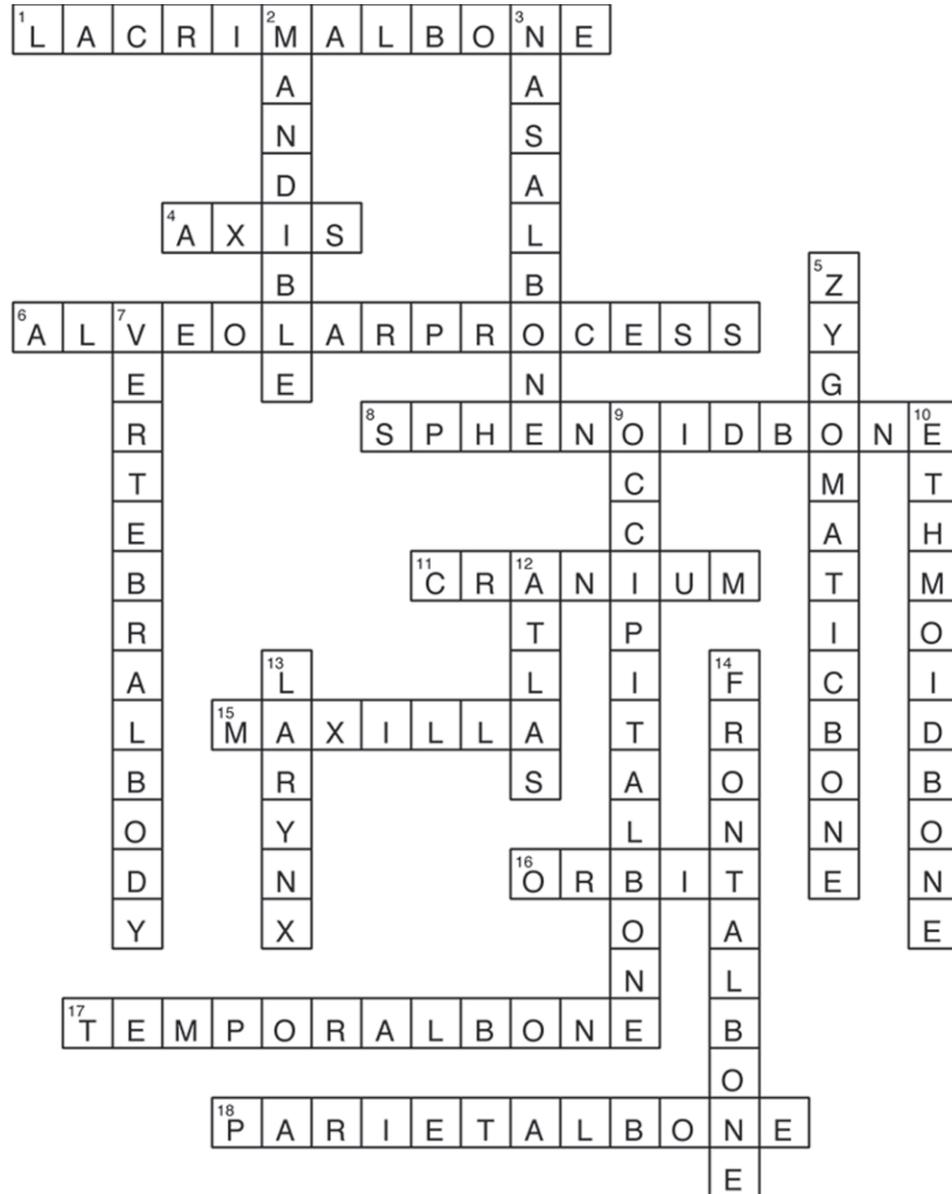
By going to this site, you will have access to a variety of Web addresses that cover the body systems in the human anatomy. Click on the body system you wish to explore to access Web sites that offer good information as well as illustrations to further explore the human body.

✓ **Note:** Web-site addresses were accurate and all content on referenced web sites was appropriate during development and production of this product. However, web sites sometimes change; MAVCC takes no responsibility for a site's content. The inclusion of a web site does not constitute an endorsement of that site's other pages, products, or owners. You are encouraged to verify all web sites prior to use.

Answers to Assignment Sheets

Assignment Sheet 2

Complete the Crossword Puzzle of Terms (Objectives 7–13)



Assignment Sheet 3

Locate and Identify Bones of the Cranium

This assignment to be evaluated by the instructor using the evaluation criteria stated on the assignment sheet.

Assignment Sheet 4

Locate and Identify Bones of the Face

This assignment to be evaluated by the instructor using the evaluation criteria stated on the assignment sheet.

Answers to Assignment Sheets

Assignment Sheet 5

Analyze Cosmetology Scenarios

Answers should include key points but may be in the student's own words.

Answers to Scenario 1

1. Which region of the vertebral column is most likely involved with the complications Ms. Wilson is experiencing?

Cervical region.

2. What should you do?

Handle Ms. Wilson with ease and care as not to hurt or damage the cervical region of the vertebral column. Place a towel in the neck of the shampoo bowl. Ask Ms. Wilson what you can do to help her feel more comfortable during the shampoo. Support Ms. Wilson's neck and back with your hands as she lies back in the shampoo bowl and as she rises from the shampoo bowl. You may ask if it would be better for her to bend forward to the shampoo bowl rather than lying in the shampoo chair.

Answers to Scenario 2

1. What area of the body is she addressing?

Forearm or arm below the elbow, wrist, palm of hand, and fingers.

2. What should you do?

Proceed with the manicure. Perform a thorough massage of the arm up to the elbow. Perform a thorough massage of the wrist, palm of the hand, and fingers.

Answers to Scenario 3

1. Where are the bones that are involved located?

Clavicle: Shoulder area

Scapula: Shoulder area

Humerus: Upper arm

2. Would you give Mansur a neck massage?

No.

3. What should you do?

Take care as not to injure or come into contact with the shoulder area. Take care when placing the client in the shampoo bowl. Let him tell you if he needs help in rising from the shampoo bowl. Continue services.

Answers to Assignment Sheets

Assignment Sheet 6

Answers to Scenario 4

1. What is the medical term given to the disorder Ms. Roehrig appears to have?

Osteoporosis

2. What part of the body has been affected by this disorder?

Spinal or vertebral column

3. What should you do?

Handle Ms. Roehrig with care and ease. Place a towel in the neck of the shampoo bowl for comfort and added protection. Make her as comfortable as possible. Take care in raising her head to shampoo the back of the neck. Place the head gently in the shampoo bowl. Continue with requested services. Remove water from the floor to prevent accidents.

Complete Module 6 Review

- | | |
|-------|-------|
| 1. a | 21. d |
| 2. a | 22. b |
| 3. c | 23. a |
| 4. c | 24. d |
| 5. c | 25. b |
| 6. d | 26. c |
| 7. b | 27. a |
| 8. b | 28. d |
| 9. d | 29. d |
| 10. c | 30. b |
| 11. b | 31. c |
| 12. d | 32. d |
| 13. b | 33. b |
| 14. c | 34. d |
| 15. a | 35. a |
| 16. b | 36. c |
| 17. d | 37. b |
| 18. d | 38. d |
| 19. c | 39. b |
| 20. c | 40. d |

Written Test

Name _____

Date _____ Score _____

Objective 1

Define the term *skeletal system*. Write your answer on the blank lines provided beside the term below.

Skeletal system _____

Objective 2

State four functions of the skeletal system. Write your answers on the blank lines provided below.

a. _____

b. _____

c. _____

d. _____

Objective 3

Complete statements that describe the types of bones as classified by their location. Write your answers on the blanks provided in the statements below.

a. Long bones are found in the arms, legs, hands, and _____.

b. Short bones include the _____ and tarsals.

c. Flat bones include the ribs, scapulae, ilium, and _____ bones.

d. Irregular bones include the vertebrae and _____ bones.

e. Sesamoids include the _____ and small bones in the hands and feet.

Written Test

Objective 4

Match the long bones of the skeleton with their definitions. Write the numbers on the blanks provided.

- | | | |
|------------|----------------|-----------|
| 1. Femur | 4. Metacarpals | 7. Radius |
| 2. Fibula | 5. Metatarsals | 8. Tibia |
| 3. Humerus | 6. Phalanges | 9. Ulna |

- _____ a. The long bones that form the framework of the sole of the foot
- _____ b. The long bone on the little-finger side of the forearm
- _____ c. The long, slender bone on the lateral side of the lower leg
- _____ d. The miniature long bones of the fingers and the miniature long bones of the toes
- _____ e. The long bone on the thumb side of the forearm
- _____ f. The shin bone; the largest bone in the lower leg
- _____ g. The thighbone; the longest, strongest bone in the body
- _____ h. The long bone in the upper arm
- _____ i. The long bones forming the framework of the palm of the hand

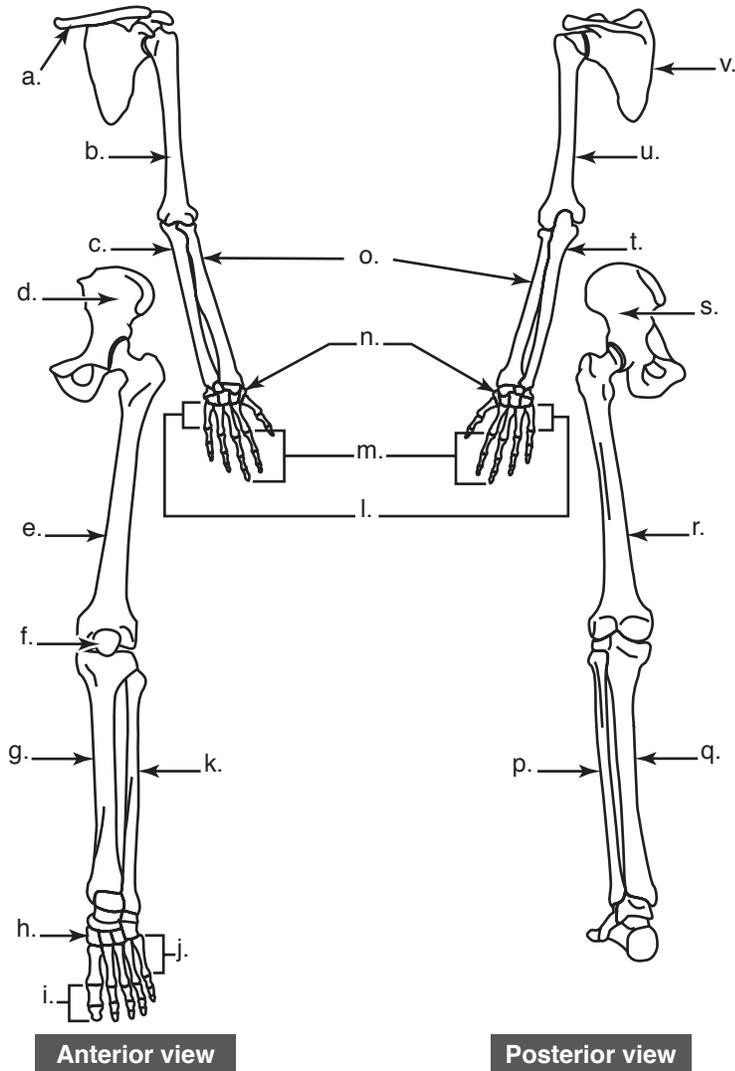
Objective 5

Distinguish between major divisions of the human skeleton. Write an "AX" on the blank before the description of the axial skeleton.

- _____ a. Centers around the vertebral column and includes the bones of the skull, the ribs and sternum, and the vertebral column; contains 80 bones
- _____ b. Includes the bones of the shoulders, pelvis, arms, and legs; contains 126 bones

Objective 6

Label the major bones of the anterior and posterior appendicular skeleton. Write your answers on the blank lines provided beside the following illustration.



- a. _____
- b. _____
- c. _____
- d. _____
- e. _____
- f. _____
- g. _____
- h. _____
- i. _____
- j. _____
- k. _____
- l. _____
- m. _____
- n. _____
- o. _____
- p. _____
- q. _____
- r. _____
- s. _____
- t. _____
- u. _____
- v. _____

Written Test

Objective 7

Match the major bones of the cranium and face with their descriptions. Write the numbers on the blanks provided.

Major bones of the cranium

- | | | |
|-------------------|------------------|------------------|
| 1. Frontal bone | 3. Parietal bone | 5. Sphenoid bone |
| 2. Occipital bone | 4. Temporal bone | 6. Ethmoid bone |

- _____ a. Either of a pair of compound bones at the side of the skull that contains various cavities and recesses associated with the ear
- _____ b. A light, spongy, cubical bone forming much of the walls of the nasal cavity and part of those of the orbits
- _____ c. A single bone that forms the front of the skull
- _____ d. Either of a pair of bones of the roof of the skull between the frontal bone and the occipital bone
- _____ e. The winged compound bone of the base of the skull and anterior to the temporal bone
- _____ f. The cuplike bone at the back of the skull that is marked by a large opening by which the skull articulates with the atlas

Major bones of the face

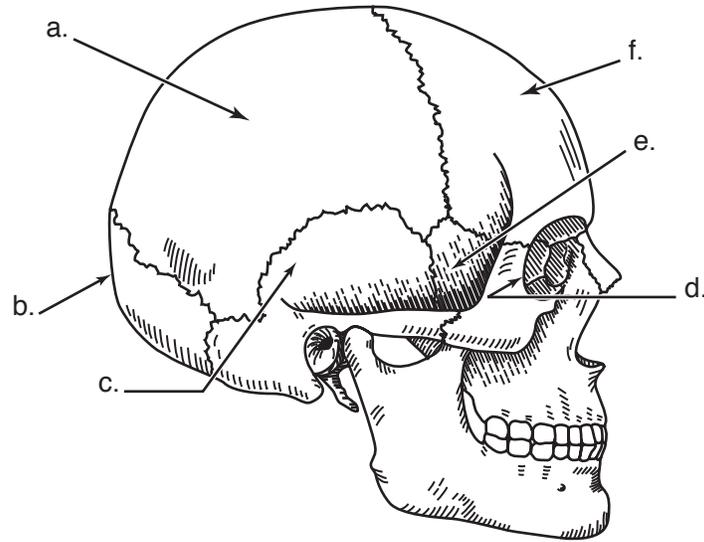
- | | | |
|---------------|------------------|---------------------|
| 1. Maxilla | 3. Lacrimal bone | 5. Alveolar process |
| 2. Nasal bone | 4. Mandible | 6. Zygomatic bone |

- _____ a. One of a pair of bones that forms the prominence of the cheek and part of the orbit; a cheekbone
- _____ b. One of a pair of large bones that form the upper jaw
- _____ c. The bone forming the nasal cavity
- _____ d. The portion of the maxilla or the mandible that forms the dental arch
- _____ e. One of the smallest and most-fragile bones of the face, located at the anterior part of the medial wall of the orbit
- _____ f. The large bone that forms the lower jaw

Objective 8

Label the major bones of the cranium and face. Write your answers on the blank lines provided under each of the following illustrations.

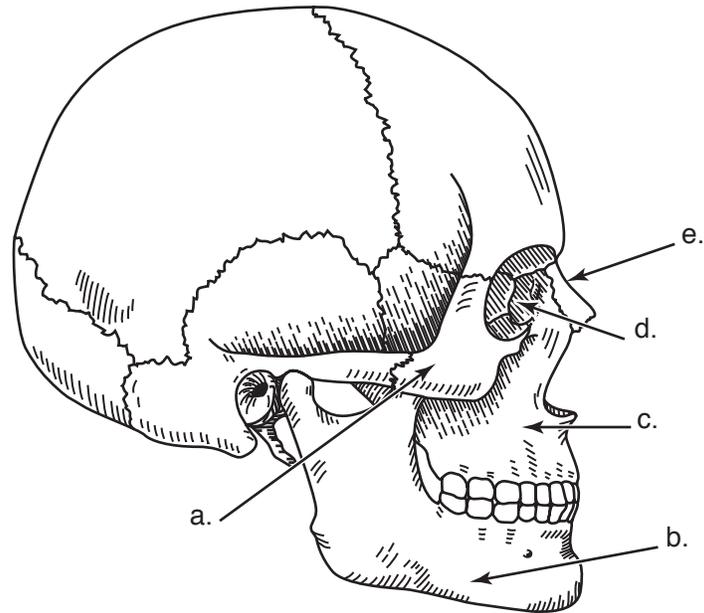
Major bones of the cranium



a. _____
 b. _____
 c. _____

d. _____
 e. _____
 f. _____

Major bones of the face



a. _____
 b. _____
 c. _____

d. _____
 e. _____

Written Test

Objective 9

Select from the following list characteristics of the hyoid bone. Place an “X” on the blank next to each correct characteristic.

- _____ a. Is considered to be part of the appendicular skeleton
- _____ b. Is a single, U-shaped bone in the neck between the mandible and the upper part of the larynx
- _____ c. Is one of the bones in the body that articulates with other bones
- _____ d. Is suspended by ligaments or processes from the temporal bone in the cranium
- _____ e. Provides an attachment for the tongue

Objective 10

Match regions and major bones and structures of the vertebral column with their descriptions. Write the numbers on the blanks provided. Descriptions continue on the next page.

Regions of the vertebral column

- | | | |
|--------------------|------------------|---------------------|
| 1. Cervical region | 3. Lumbar region | 5. Coccygeal region |
| 2. Thoracic region | 4. Sacral region | |

- _____ a. The region consisting of the five largest segments of the movable part of the vertebral column
- _____ b. The region consisting of the first seven segments of the vertebral column
- _____ c. The region consisting of 12 segments of the upper-back portion of the vertebral column
- _____ d. The region consisting of four segments of the vertebral column that fuse to form the adult coccyx
- _____ e. The region consisting of five segments of the vertebral column that fuse in the adult to form the sacrum

Major bones and structures of the vertebral column

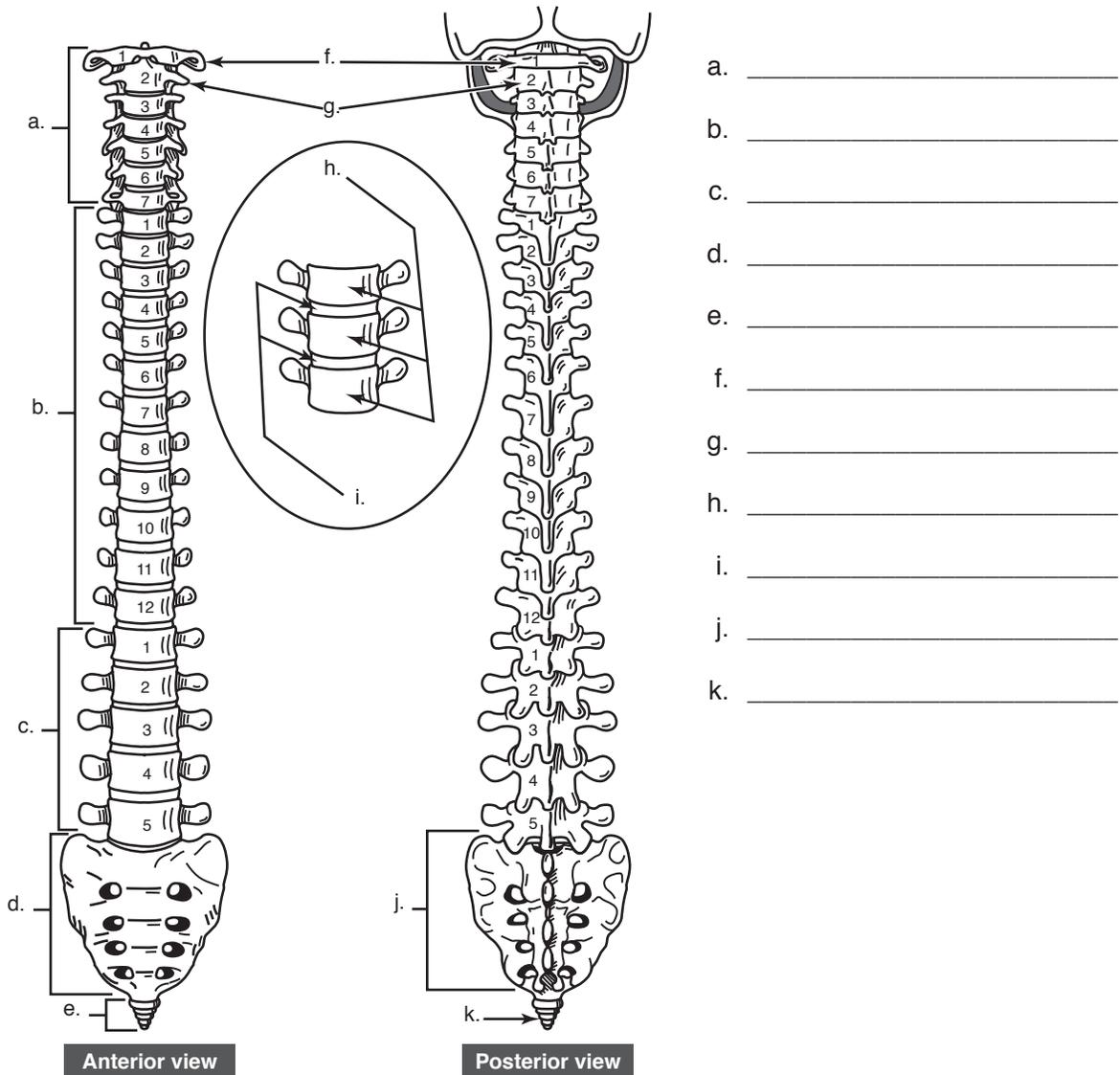
- | | |
|-------------------|------------------------|
| 1. Atlas | 4. Intervertebral disc |
| 2. Axis | 5. Sacrum |
| 3. Vertebral body | 6. Coccyx |

- _____ a. The second cervical vertebra about which the atlas rotates, allowing the head to be turned, extended, and flexed
- _____ b. The beaklike bone joined to the sacrum by a disc of fibrocartilage at the base of the vertebral column

- _____ c. The weight-supporting, solid central portion of a vertebra
- _____ d. The large, triangular bone at the dorsal part of the pelvis, inserted like a wedge between the two hip bones
- _____ e. The first cervical vertebra that articulates with the occipital bone and the axis
- _____ f. This is found between adjacent vertebrae, except for the atlas and the axis

Objective 11

Label the regions and the major bones and structures of the vertebral column. Write your answers on the blank lines provided beside the following illustration.



- a. _____
- b. _____
- c. _____
- d. _____
- e. _____
- f. _____
- g. _____
- h. _____
- i. _____
- j. _____
- k. _____

Written Test

Objective 12

Complete statements that describe the characteristics of the ribs and sternum. Write your answers on the blank lines provided in the statements below.

Ribs

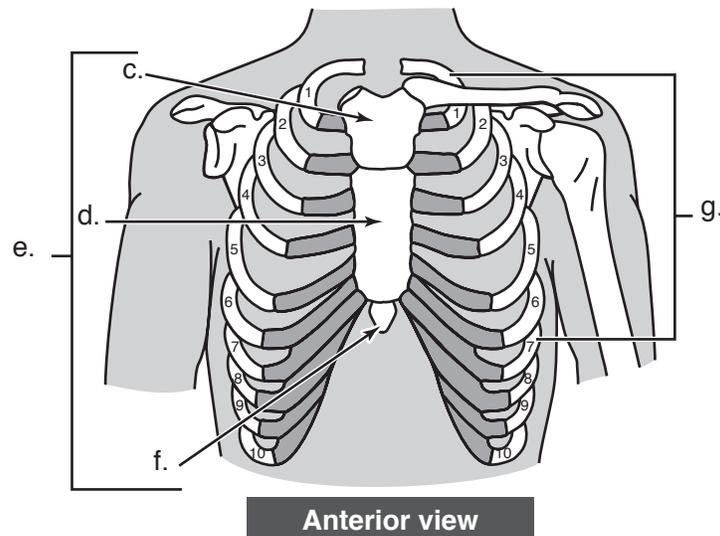
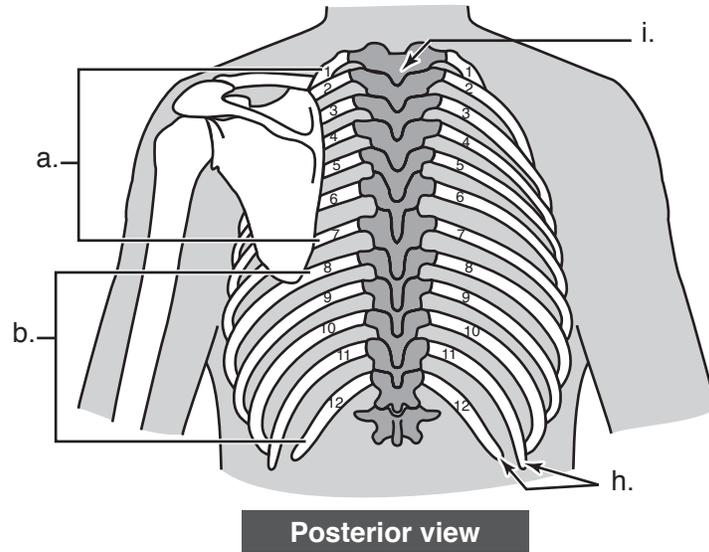
- a. All ribs attach to the _____ region of the vertebral column.
- b. There are _____ rib pairs.
- c. The upper 7 rib pairs attach directly to the sternum; these are known as the _____ ribs.
- d. The lower 5 rib pairs (rib pairs 8 through 12) are referred to as the _____ ribs.
- e. Rib pairs 11 and 12 are not attached to the sternum and are called the _____ ribs.
- f. Rib pairs 8, 9, and 10 attach to the costal cartilage of the _____ rib.

Sternum

- a. The top section of the sternum is called the _____, and it provides the attachment for rib pair 1.
- b. The middle (body) section of the sternum is called the _____, and it provides the attachment for rib pairs 2 through 7.
- c. The lowest section of the sternum is called the _____ process.

Objective 13

Label the major bones and structures of the ribs and sternum. Write your answers on the blank lines provided under the illustration below.



- | | |
|----------|----------|
| a. _____ | f. _____ |
| b. _____ | g. _____ |
| c. _____ | h. _____ |
| d. _____ | i. _____ |
| e. _____ | |

*Permission to duplicate this test is granted.

Answers to Written Test

Objective 1	Skeletal system—All of the bones and cartilage of the body that collectively provide the supporting framework for the muscles and organs		
Objective 2	Any four of the following:		
	a.	Provides support for the body	
	b.	Gives shape to the body	
	c.	Protects delicate vital organs	
	d.	Assists with body movements	
	e.	Manufactures blood cells	
	f.	Stores calcium and phosphorus	
Objective 3	a.	feet	
	b.	carpals	
	c.	cranial	
	d.	facial	
	e.	patella	
Objective 4	a.	5	d. 6
	b.	9	e. 7
	c.	2	f. 8
			g. 1
			h. 3
			i. 4
Objective 5	a.		
Objective 6	a.	Clavicle	
	b.	Humerus	
	c.	Ulna	
	d.	Ilium	
	e.	Femur	
	f.	Patella	
	g.	Tibia	
	h.	Tarsals	
	i.	Phalanges	
	j.	Metatarsals	
	k.	Fibula	
	l.	Metacarpals	
	m.	Phalanges	
	n.	Carpals	
	o.	Radius	
	p.	Fibula	
	q.	Tibia	
	r.	Femur	
	s.	Ilium	
	t.	Ulna	
	u.	Humerus	
	v.	Scapula	

Answers to Written Test

Objective 7

Cranium

- a. 4
- b. 6
- c. 1
- d. 3
- e. 5
- f. 2

Face

- a. 6
- b. 1
- c. 2
- d. 5
- e. 3
- f. 4

Objective 8

Major bones of the cranium

- a. Parietal bone
- b. Occipital bone
- c. Temporal bone
- d. Ethmoid bone
- e. Sphenoid bone
- f. Frontal bone

Major bones of the face

- a. Zygomatic bone
- b. Mandible
- c. Maxilla
- d. Lacrimal bone
- e. Nasal bone

Objective 9

b, d, e

Objective 10

Regions of the vertebral column

- a. 3
- b. 1
- c. 2
- d. 5
- e. 4

Major bones and structures of the vertebral column

- a. 2
- b. 6
- c. 3
- d. 5
- e. 1
- f. 4

Answers to Written Test

Objective 11

- a. Cervical region
- b. Thoracic region
- c. Lumbar region
- d. Sacral region
- e. Coccygeal region
- f. Atlas
- g. Axis
- h. Vertebral body
- i. Intervertebral disc
- j. Sacrum
- k. Coccyx

Objective 12

Ribs

- a. thoracic
- b. 12
- c. true
- d. false
- e. floating
- f. seventh

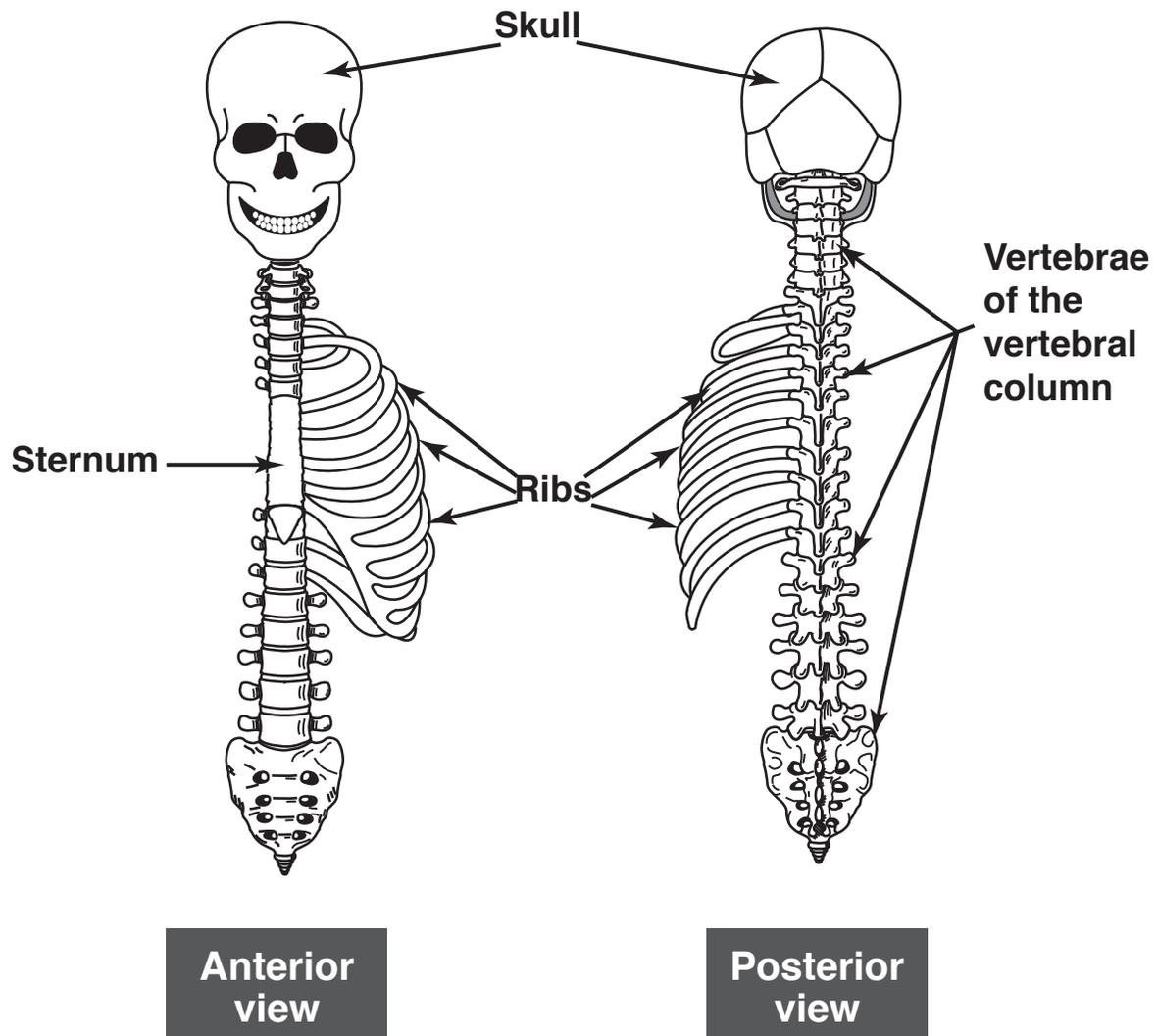
Sternum

- a. manubrium
- b. gladiolus
- c. xiphoid

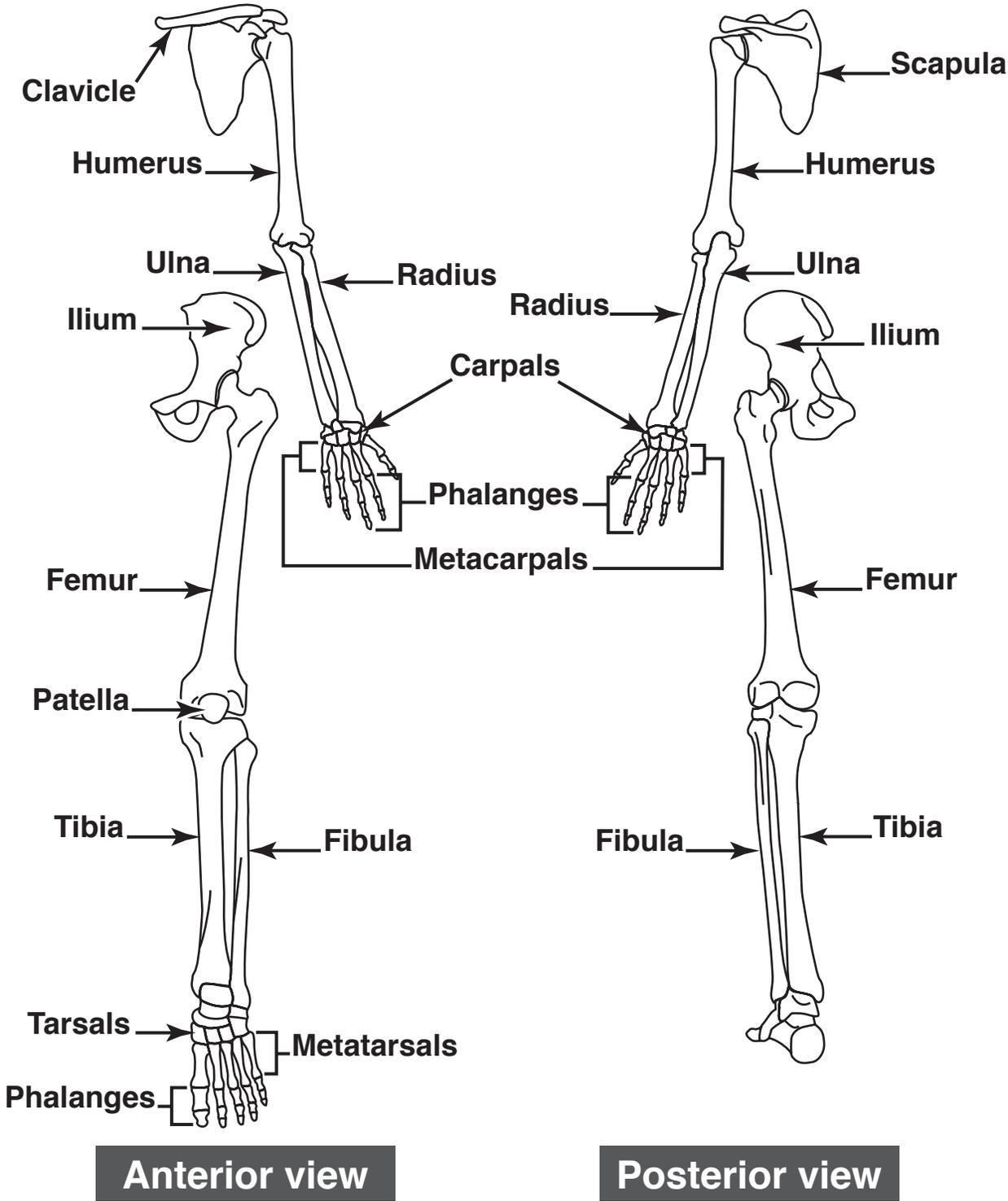
Objective 13

- a. True ribs
- b. False ribs
- c. Manubrium
- d. Gladiolus
- e. Sternum
- f. Xiphoid process
- g. True ribs
- h. Floating ribs
- i. Vertebral column

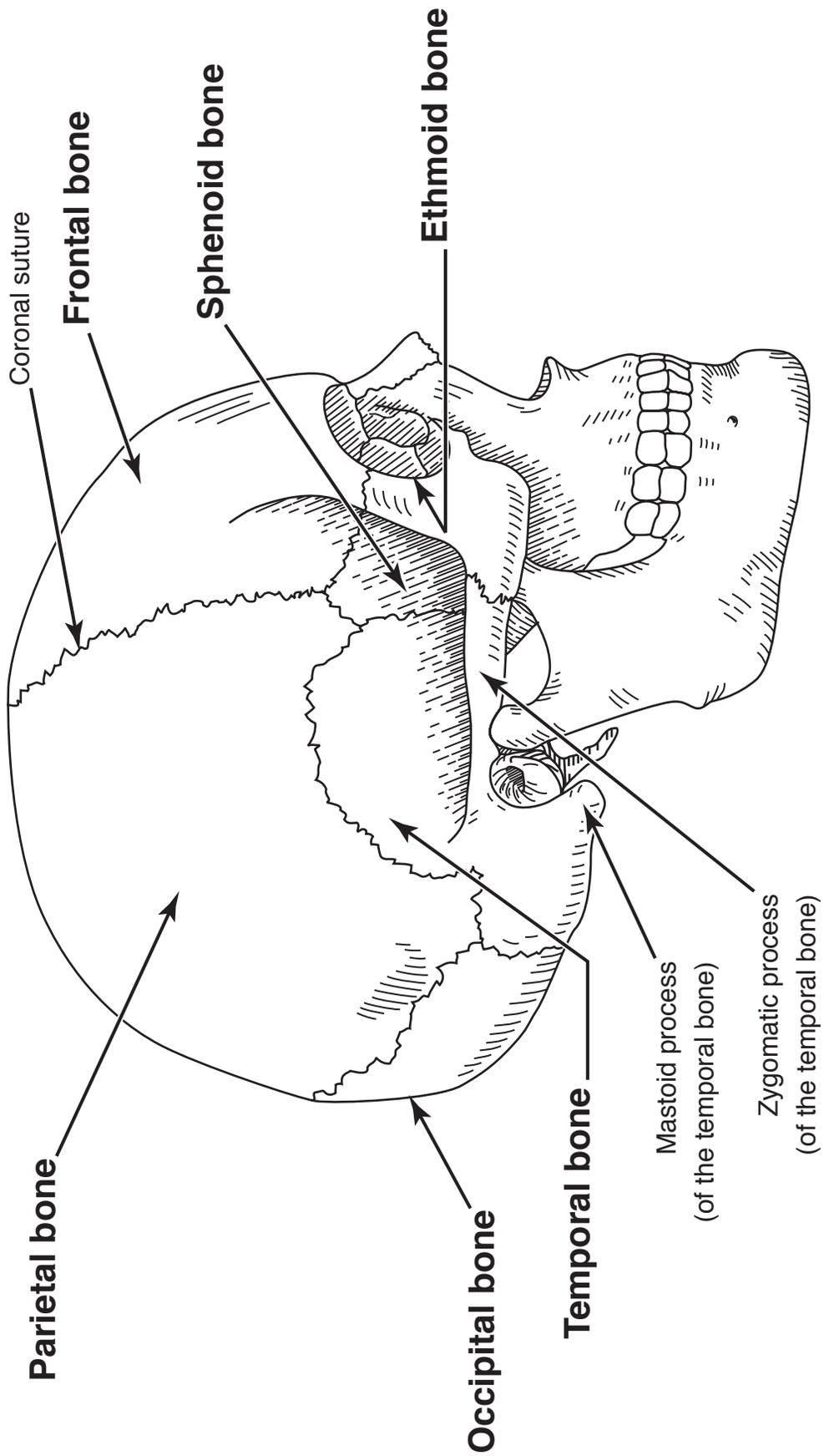
Major Components of the Anterior and Posterior Axial Skeleton



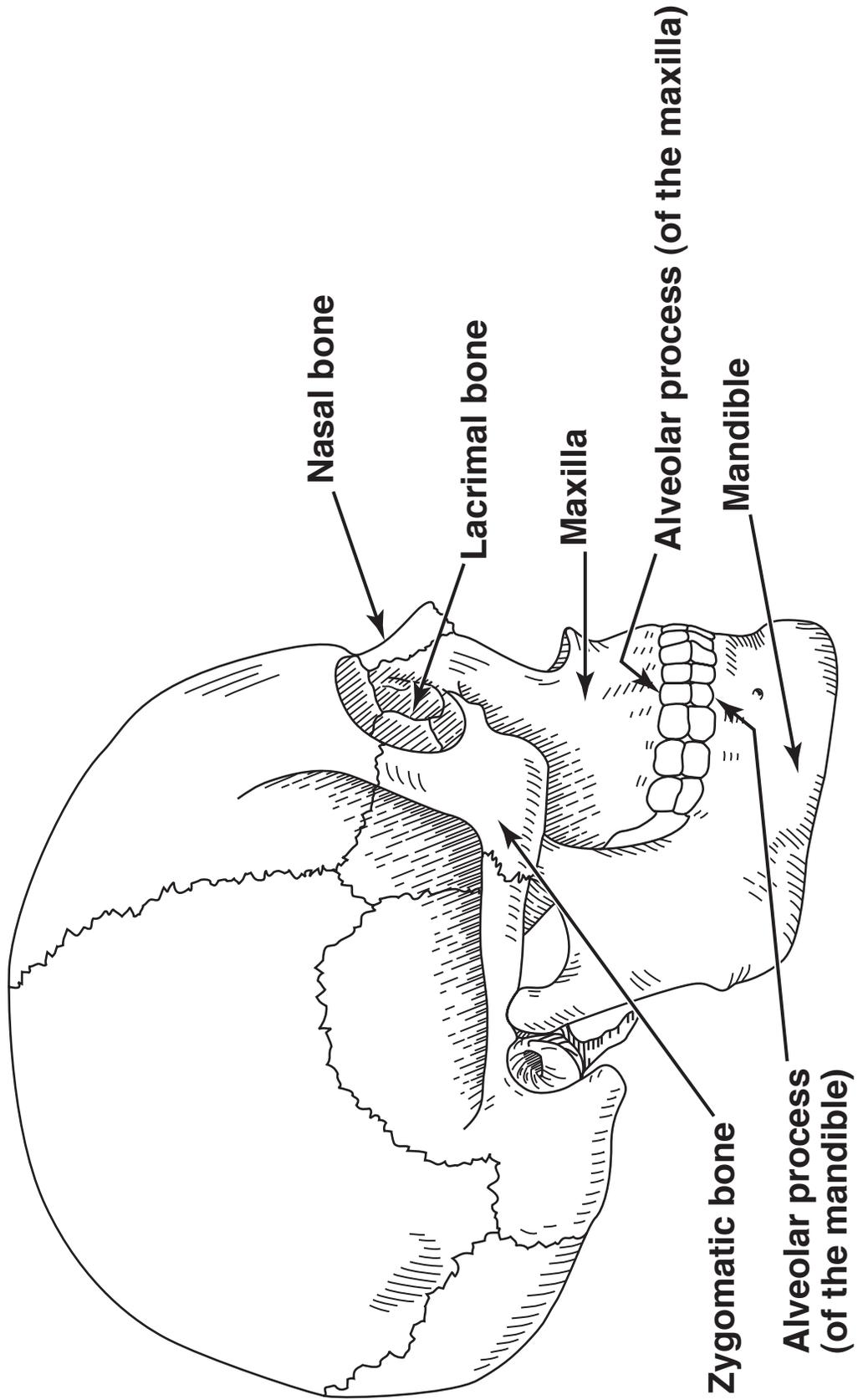
Major Bones of the Anterior and Posterior Appendicular Skeleton



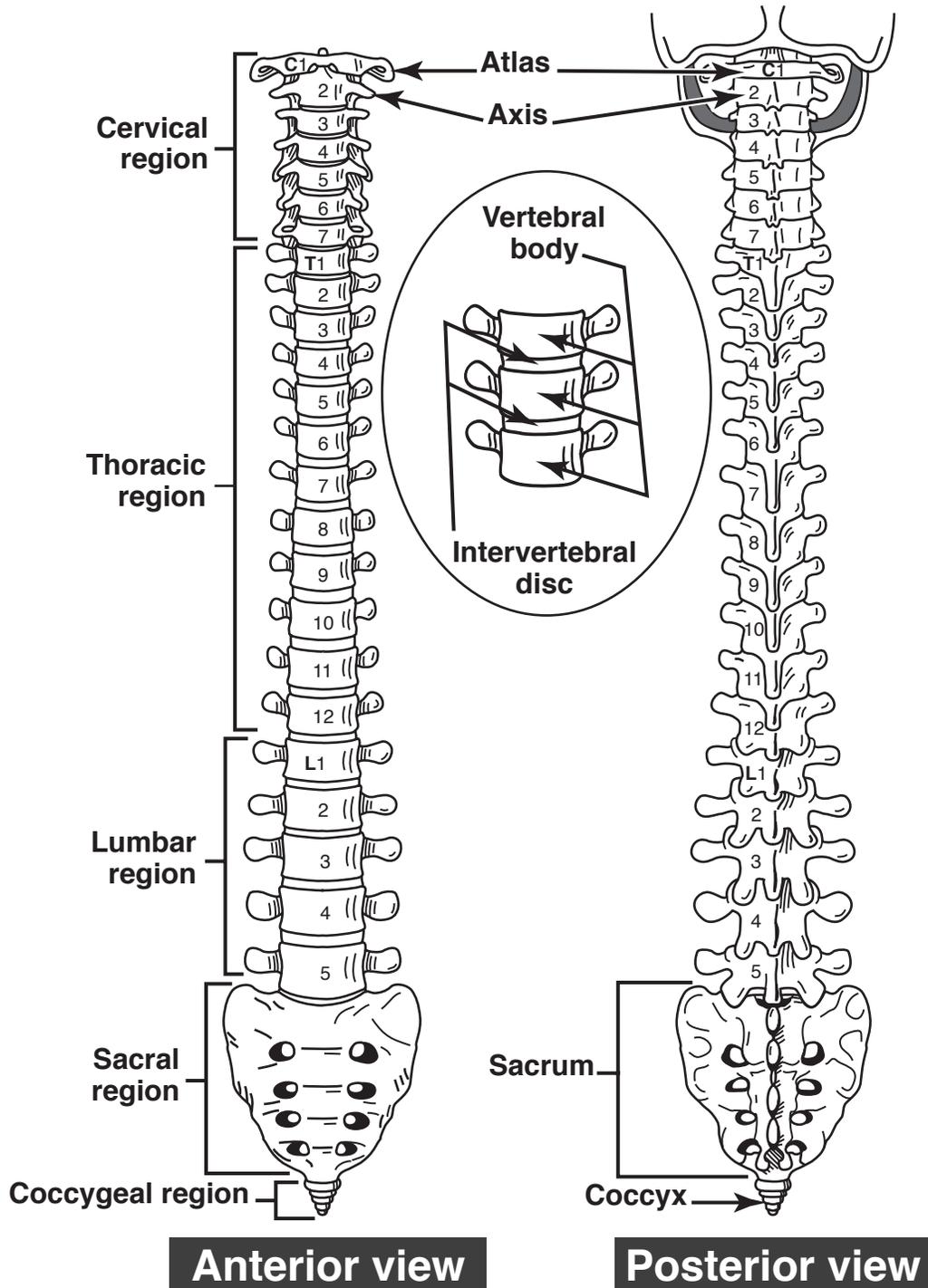
Major Bones and Structures of the Cranium



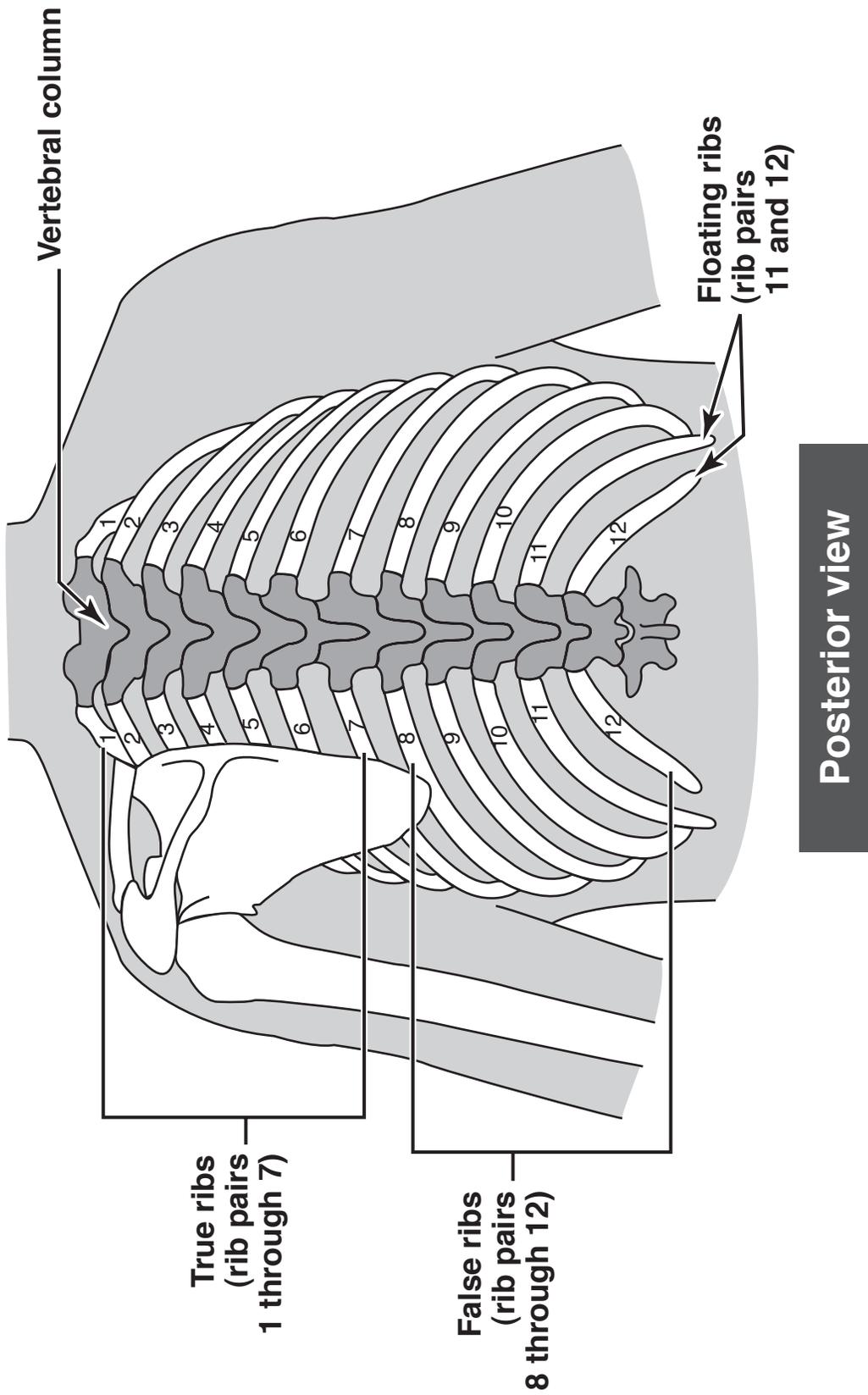
Major Bones and Structures of the Face



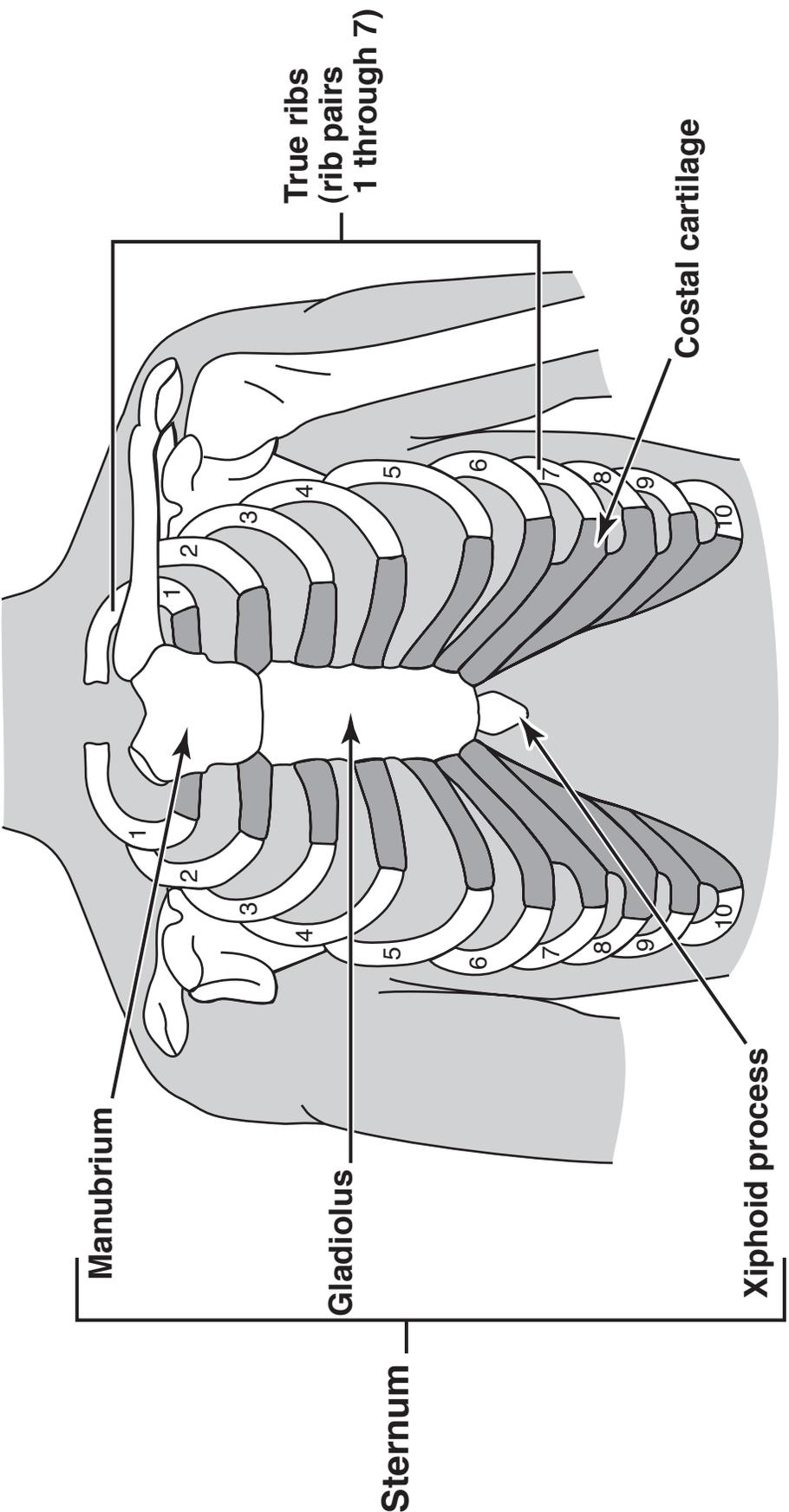
Regions and Major Bones and Structures of the Vertebral Column



Major Bones and Structures of the Ribs and Sternum



Major Bones and Structures of the Ribs and Sternum (continued)



Anterior view

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* Assignment Sheets are located in the Student Workbook.		

Instructional Plan

Suggested Activities

Preparation

- Read the module carefully and plan for instruction.
- Review “Teaching Suggestions.” Plan for classroom activities.
- Plan your presentation to take advantage of student learning styles and to accommodate special-needs students.
- Prepare classroom. Put up posters and charts and display articles and other references related to this module.
- Obtain resources to supplement instruction of this module. See “Resources Used in Developing This Module” and “Suggested Supplemental Resources.”
- Review the “Suggested Web Sites,” and make a list of additional sites you may have found for students to research to learn more about the muscular system.
- For self-paced instruction, review Learning Activities Sheet. Go to “customizable files” link on teacher edition CD and modify as appropriate to include additional activities and/or resources available in your classroom. Make one copy for each student.
- Make copies of any teacher supplements that you have created that will be provided for each student.
- Make transparencies from the transparency masters included in this module. These appear in teacher edition only. A PowerPoint® presentation of transparencies is located on the teacher edition CD.

Delivery and Application

Module Introduction (self-paced instruction)

- Refer student to Learning Activities Sheet and module of instruction located in student guide.
- Review module contents with student.
- Have the student complete the steps in the Learning Activities Sheet.

Module Introduction (group instruction)

- Provide students with module of instruction.

Suggested Activities

- Discuss module and specific objectives.
- Discuss the information sheet. Implement teaching plan to localize, supplement, and personalize the module. Reinforce basic academic and workplace skills when applicable.
- Discuss the assignment sheets. Review with students the criteria for evaluation of these activities.

Teaching Suggestions

- ✓ **Note:** This module has two primary purposes: to introduce students to the muscular system, and to build the students' anatomy and physiology vocabularies. Look for opportunities to reinforce both goals as you present the module.
- Select one of the classroom literacy activities provided in Module 1, Teacher Supplement 1. Use with students to help them improve their literacy skills and to learn new subject matter.
- Use crossword puzzle (Assignment Sheet 1) to help reinforce the terms in objectives 1 through 8.
- To supplement Objective 1, which defines the term muscular system, use photos of muscle builders to illustrate the interrelatedness of the muscles that form the muscle system.
- To supplement Objective 3, which describes the major classifications of muscle tissue (skeletal, visceral, and cardiac), provide students with cuts of meat representative of the three classes of muscle tissue. Discuss the distinguishing characteristics of the three classes and point out the typical body locations of each class of tissue. Discuss how the function of each class of muscle tissue relates to its structure and contraction rate.
- Use illustrations to supplement Objective 4 through Objective 7, which identify and define the major structures of skeletal muscles, describe the characteristics of the bone/muscle attachments of skeletal muscles, and describe how skeletal muscles function. Relate the structures of skeletal muscles and the characteristics of their attachments to their roles in performing muscle functions.
- Objective 8 defines the terms that describe the functional characteristics of muscle tissue: irritability, conductivity, extensibility, elasticity, contractility, and tone. To illustrate conductivity, set up an electrical circuit with a battery-powered light. Show how the light illuminates when the wires are connected to the battery. Use a large rubber band to illustrate extensibility and elasticity. Have students stand and allow their arms to hang loosely, and then point out that the slightly flexed tension of their arms demonstrates muscle tone.

Suggested Activities

- Use crossword puzzle (Assignment Sheet 2) to help reinforce the terms presented in Objective 9.
- Use crossword puzzle (Assignment Sheet 3) to help reinforce the terms presented in objectives 10 through 12.
- Objective 10 introduces the major muscle groups and states their general functions. Expand the objective by discussing the role of the specific muscles in each group, which are presented in objectives 11 through 18.
- Invite a massage therapist to discuss with students the benefits of muscle massage.
- To expand student knowledge of muscles of the head, face, and neck have students work in teams and go online and research the following muscles: epicranium, occipitofrontalis, and auricularis superior. Or, have students find out more about the muscles identified in Objectives 11 and 12 and then report back to the class.
- To illustrate the functions of the major muscles of the face (Objective 11), have students demonstrate facial expressions such as smiling, frowning, surprise, questioning, etc.
- Use Assignment Sheet 4 to assess the student's knowledge of the major muscles of the head, face, and neck.
- Use crossword puzzle (Assignment Sheet 5) to help reinforce the terms presented in objectives 13 through 16.
- Use crossword puzzle (Assignment Sheet 6) to help reinforce the terms presented in objectives 17 and 18.
- Use module review (Assignment Sheet 8) to assess student knowledge of the muscular system.

Evaluation

- Make copies of the written test. Using the Word® file included on the teacher edition CD, add or modify test items as needed. The written test serves as both a pretest and posttest to assist in measuring each student's competency gains.
- Give and evaluate pretest. Modify lesson plan to include additional instruction for those areas where students were deficient.
- Evaluate the assignment sheets. Rate the student using the criteria listed on each assignment sheet. See Answers to Assignment Sheets for correct answers where applicable. If the student's performance is unacceptable, have the student review the appropriate materials and complete the assignment again.

Suggested Activities

Resources Used in Developing This Module

- Give and evaluate the posttest.
- Meet individually with students to evaluate their progress through this module of instruction and indicate to them possible areas for improvement.
- Reteach and retest as required.

Print Media

- *Anatomy and Physiology*. Stillwater, OK: Multistate Academic and Vocational Curriculum Consortium, Inc., 2002.
- Gray, Henry. *Gray's Anatomy*, 39th ed. New York: Mosby, 2004.
- Gylys, Barbara A., and Regina Masters. *Medical Terminology Simplified*, 3rd ed. Philadelphia: F.A. Davis Company, 2005.
- Scanlon, Valerie C. and Tina Sanders. *Essentials of Anatomy and Physiology*, 4th ed., Philadelphia: F.A. Davis Company, 2002.
- Thibodeau, Gary A., and Kevin T. Patton. *Anatomy and Physiology*, 5th ed. St. Louis: Mosby, 2002.

Suggested Supplemental Resources

Print Media

- *Basic Operator*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2006.
- *Basic Esthetician*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.
- *Basic Manicurist*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.

Suggested Web Sites

- ✓ **Note:** The following web sites offer general information about anatomy and physiology and generally cover more than one body system.

<http://www.ptcentral.com/muscles>

This site provides an alphabetical listing of about 97 percent of all muscles. Clicking on the muscles and other links provides the student with detailed information about the muscles. The detail is more in-depth than that provided in the module, and it will be useful to supplement lessons.

Suggested Activities

- <http://www.rad.washington.edu/atlas>

This site provides illustrations and descriptions of the upper and lower extremity muscles and provides students with additional information about the muscular system.

- <http://www-sci.lib.uci.edu/~martindale/MedicalAnatomy.html>

This site provides a wealth of information and many useful graphics about human anatomy.

- <http://en.wikipedia.org/wiki/integumentarysystem>

This site provides great information on the various body systems that make up the human body. To move from one body system to another, simply change the system name in the Web address. For example, change "integumentary" to "muscular" to go to the section of this on-line encyclopedia that addresses that system.

- <http://dir.yahoo.com/science/biology/anatomy>

By going to this site, you will have access to a variety of Web addresses that cover the body systems in the human anatomy. Click on the body system you wish to explore to access Web sites that offer good information as well as illustrations to further explore the human body.

- <http://www.howstuffworks.com/muscle.htm>

This site provides students with more in-depth information and illustrations related to the muscular system.

- ✓ **Note:** Web-site addresses were accurate and all content on referenced web sites was appropriate during development and production of this product. However, web sites sometimes change; MAVCC takes no responsibility for a site's content. The inclusion of a web site does not constitute an endorsement of that site's other pages, products, or owners. You are encouraged to verify all web sites prior to use.

Answers to Assignment Sheets

2. What should you do?

Prepare for the service as usual. Arrange Ms. Kirkland in a comfortable position at the manicure station. During the massage—take care to relax the pollicis muscles first. Gently move to the digitorum muscles and brachioradialis muscles. Feel for the tightness and relaxation of the muscles as you massage them. Once the muscles feel relaxed, gently flex the wrist back and forth. Rotate the wrist clockwise, then reverse to counterclockwise motion to relieve the tightness. Return to the digitorum and brachioradialis muscles for gentle massage. Check for relaxation of the muscles. Repeat the massage procedure until the muscles feel relaxed and soft. Complete the service.

Answers to Scenario 2

What should you do?

Discuss what Nalini thinks happened to her leg. Feel the muscles in the legs for knots or anything that feels different. Allow Nalini to soak in the pedicure tub longer to help relax the muscles. Start the massage gently. Ask Nalini to let you know how the massage feels. Move to a deeper leg and foot massage. Verify with Nalini that the massage is relieving the tightness and that no pain is involved in what you are doing.

Decision making—If Nalini indicates that the massage is not helping, revert to gentle massage as not to cause damage.

Decision making—If Nalini states that the massage is helping the muscle relax, continue with the service.

Answers to Scenario 3

1. What do you do?

Begin with a head massage and move to the neck and shoulders. As you move to the neck and shoulders, question Mr. Santos concerning any injuries to the area.

Decision making—If Mr. Santos has experienced a blow or was involved in an accident prior to coming to the salon you may want to stop the massage to prevent further damage or to hinder healing.

Decision making—If Mr. Santos has not experienced anything different this week and it is one of his regular headaches that the massage usually helps, continue with the massage.

Mr. Santos expresses that his sinus is giving him trouble.

2. What do you do?

Ask if he would like a face massage. Explain that he may receive the massage without having a full facial. Continue with the head, neck, and shoulder massage until complete. Continue with the facial massage. Once the massages are complete, continue with the shampoo and haircut.

Answers to Assignment Sheets

Assignment Sheet 8

Complete Module 7 Review

- | | | | |
|-------|-------|-------|-------|
| 1. c | 11. b | 21. b | 31. b |
| 2. b | 12. d | 22. c | 32. b |
| 3. b | 13. c | 23. d | 33. a |
| 4. d | 14. a | 24. a | 34. b |
| 5. b | 15. b | 25. c | 35. c |
| 6. b | 16. b | 26. c | 36. d |
| 7. a | 17. b | 27. a | 37. b |
| 8. d | 18. a | 28. a | 38. b |
| 9. d | 19. d | 29. a | 39. b |
| 10. d | 20. a | 30. d | 40. a |

Written Test

Name _____

Date _____ Score _____

Objective 1

Define the term *muscular system*. Write your answer on the blank lines provided beside the term below.

Muscular system _____

Objective 2

State four functions of the muscular system. Write your answers on the blank lines provided below.

a. _____

b. _____

c. _____

d. _____

Objective 3

Distinguish among the major classifications of muscle tissue. Write an “S” on the blank next to the description of skeletal muscle tissue, a “V” on the blank next to the description of visceral muscle tissue, and a “C” next to the description of cardiac muscle tissue.

_____ a. Is involuntary; is non-striated, consisting of spindle-shaped cells; is found in the stomach, intestines, urinary ducts, and blood vessels; contracts slowly in response to stimulation to nerve impulses

_____ b. Is involuntary; is partially striated; is found only in the heart; contracts moderately fast in response to stimulation to nerve impulses

_____ c. Is voluntary; is striated, consisting of long, slender, striped cells; acts in opposing groups with some muscles relaxing and some contracting; contracts quickly in response to stimulation of nerve impulses

Written Test

Objective 4

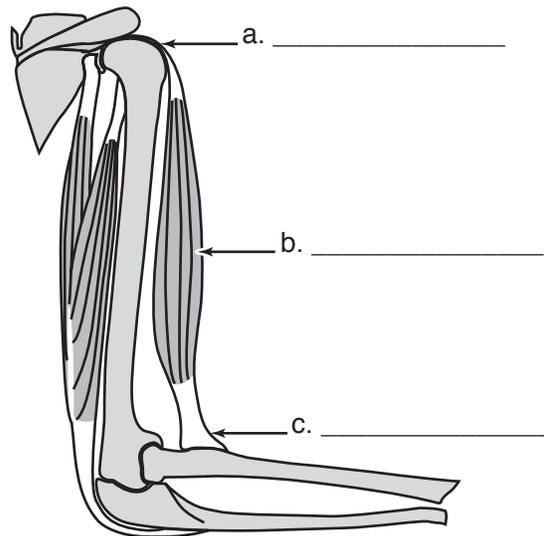
Match the major structures of skeletal muscles with their definitions. Write the numbers on the blanks provided.

1. Origin 2. Insertion 3. Body

- _____ a. The largest or the main part of a skeletal muscle
- _____ b. The less-movable end of a skeletal-muscle attachment that is closer to the midline of the trunk of the body and is attached to the less-movable end of the bone
- _____ c. The end of a skeletal-muscle attachment that is attached to the more-movable bone

Objective 5

Label the major structures of skeletal muscles. Write your answers on the blanks provided beside the illustration below.



Objective 6

Complete statements that describe the characteristics of the bone/muscle attachments of skeletal muscles. Write your answers on the blank lines provided in the statements below.

- a. Skeletal muscles are enclosed in the _____, which is continuous with the fibrous structures that attach the muscles to bones and other structures.
- b. Skeletal muscles are firmly attached to the structures on which they pull during _____.
- c. Skeletal muscles may be attached directly to the periosteum of a bone or may be attached by _____ or aponeuroses.

Objective 7

Complete statements that describe how skeletal muscles function. Write your answers on the blank lines provided in the statements below.

- a. Muscles contract in response to electrical impulses, either the natural stimulus of a motor-nerve impulse or an artificial stimulus such as _____.
- b. Muscles that move a body part usually lie _____ to the part that they move.
- c. Locomotion of the body is caused by muscles pulling on the _____.
- d. Body _____ result from coordinated actions in pairs of muscles.
- e. The coordinated actions of a pair of muscles generally mean that one muscle contracts while the other _____.
- f. Normal movements of body parts are the result of the coordinated motion of several _____ of muscles.
- g. The energy to produce movement in muscles is released from simple sugars through _____.

Objective 8

Match terms that describe the functional characteristics of muscle tissue with their definitions. Write the numbers on the blanks provided.

- | | | |
|-----------------|------------------|------------------|
| 1. Irritability | 3. Extensibility | 5. Contractility |
| 2. Conductivity | 4. Elasticity | 6. Tone |

- _____ a. The slight tension that is present in muscles even when they are at rest so that they can respond more easily and quickly when needed
- _____ b. The ability to transmit impulses
- _____ c. The ability to contract or shorten
- _____ d. The ability to respond to stimuli
- _____ e. The ability to return to a former length when the stretching force is removed
- _____ f. The ability to stretch (lengthen) and remain stretched (hold)

Written Test

Objective 9

Match types of muscles with the type of action they accomplish. Write the numbers on the blanks provided.

- | | | |
|--------------|---------------|-----------------|
| 1. Abductor | 7. Rotator | 13. Pronator |
| 2. Adductor | 8. Protractor | 14. Dorsiflexor |
| 3. Levator | 9. Retractor | 15. Sphincter |
| 4. Depressor | 10. Invertor | 16. Tensor |
| 5. Flexor | 11. Evertor | |
| 6. Extensor | 12. Supinator | |

- _____ a. Lifting a part
- _____ b. Turning or rotating a part outward
- _____ c. Straightening a part at a joint
- _____ d. Bending a part at a joint
- _____ e. Closing a body opening
- _____ f. Turning a part downward
- _____ g. Moving away from a part or a midline
- _____ h. Lowering a part
- _____ i. Moving toward a part or toward a midline
- _____ j. Making a part more rigid
- _____ k. Moving a part back
- _____ l. Moving a part so that its distal point travels in a circle
- _____ m. Turning a part upward
- _____ n. Moving a part toward the back
- _____ o. Moving a part forward
- _____ p. Turning a part upside down or inside out

Objective 10

Match major muscle groups with their functions. Write the numbers on the blanks provided.

- | | |
|--------------------------|----------------------|
| 1. Head and face muscles | 4. Chest muscles |
| 2. Neck muscles | 5. Abdominal muscles |
| 3. Back muscles | 6. Perineal muscles |

- _____ a. Support the internal organs, assist in respiration, and assist in eliminating waste from the large intestine and bladder
- _____ b. Assist in defecation and urination and form the floor of the pelvic cavity
- _____ c. Move the head from side to side, from front to back, and in rotation
- _____ d. Control talking, chewing, swallowing, facial expressions, and blinking
- _____ e. Allow the body to bend, turn, and stand erect
- _____ f. Assist in respiration and movements of the neck, arms, and trunk

Objective 11

Match the major muscles of the head, face, and neck with their functions. Write the numbers on the blanks provided.

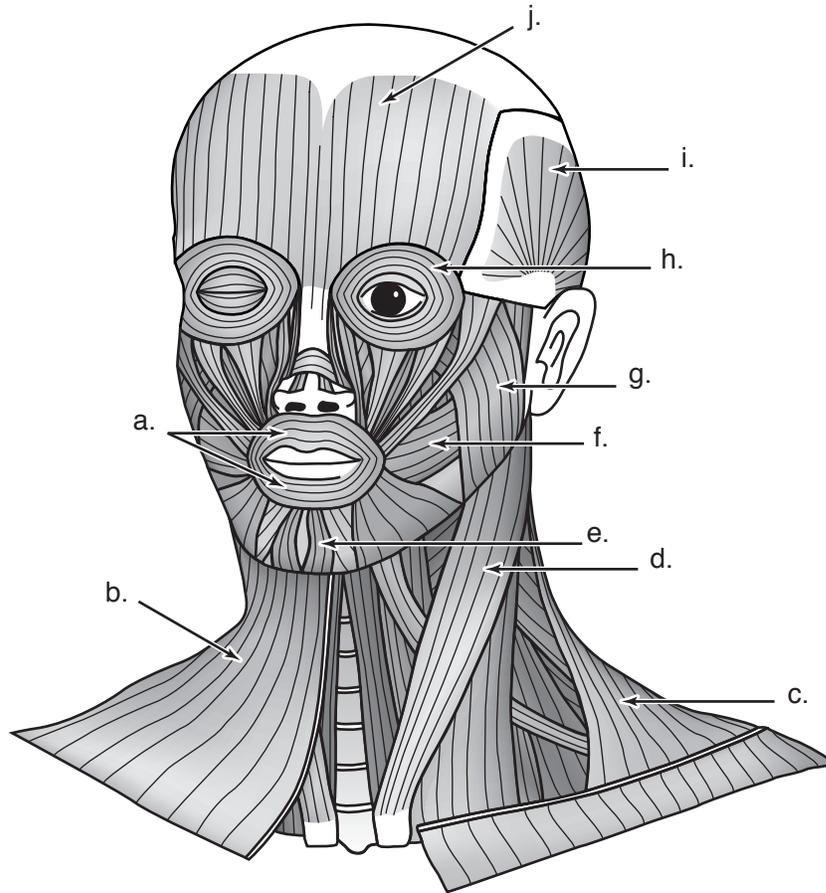
- | | |
|----------------------|------------------------|
| 1. Frontalis | 6. Masseter |
| 2. Temporalis | 7. Trapezius |
| 3. Orbicularis oculi | 8. Sternocleidomastoid |
| 4. Orbicularis oris | 9. Platysma |
| 5. Buccinator | 10. Mentalis |

- _____ a. Draws the lips together as in kissing
- _____ b. Raises and wrinkles the skin of the chin, elevating lower lip
- _____ c. Acts to wrinkle the skin in the neck and depresses the mandible
- _____ d. Moves the shoulders by raising, assists in moving the head to one side or the other, and helps hold the head erect
- _____ e. Wrinkles the forehead horizontally
- _____ f. Moves the lips for blowing, whistling, and smiling
- _____ g. Rotates the head from side to side, flexes the upper vertebral column and head as in bowing the head, and helps hold the head erect
- _____ h. Closes the mandible
- _____ i. Closes the eyelids
- _____ j. Closes the jaws as in chewing

Written Test

Objective 12

Label the major muscles of the head, face, and neck. Write your answers on the blanks provided under the illustration below.



a. _____
b. _____
c. _____
d. _____
e. _____

f. _____
g. _____
h. _____
i. _____
j. _____

Objective 13

Match the major muscles of the torso with their functions. Write the numbers on the blanks provided.

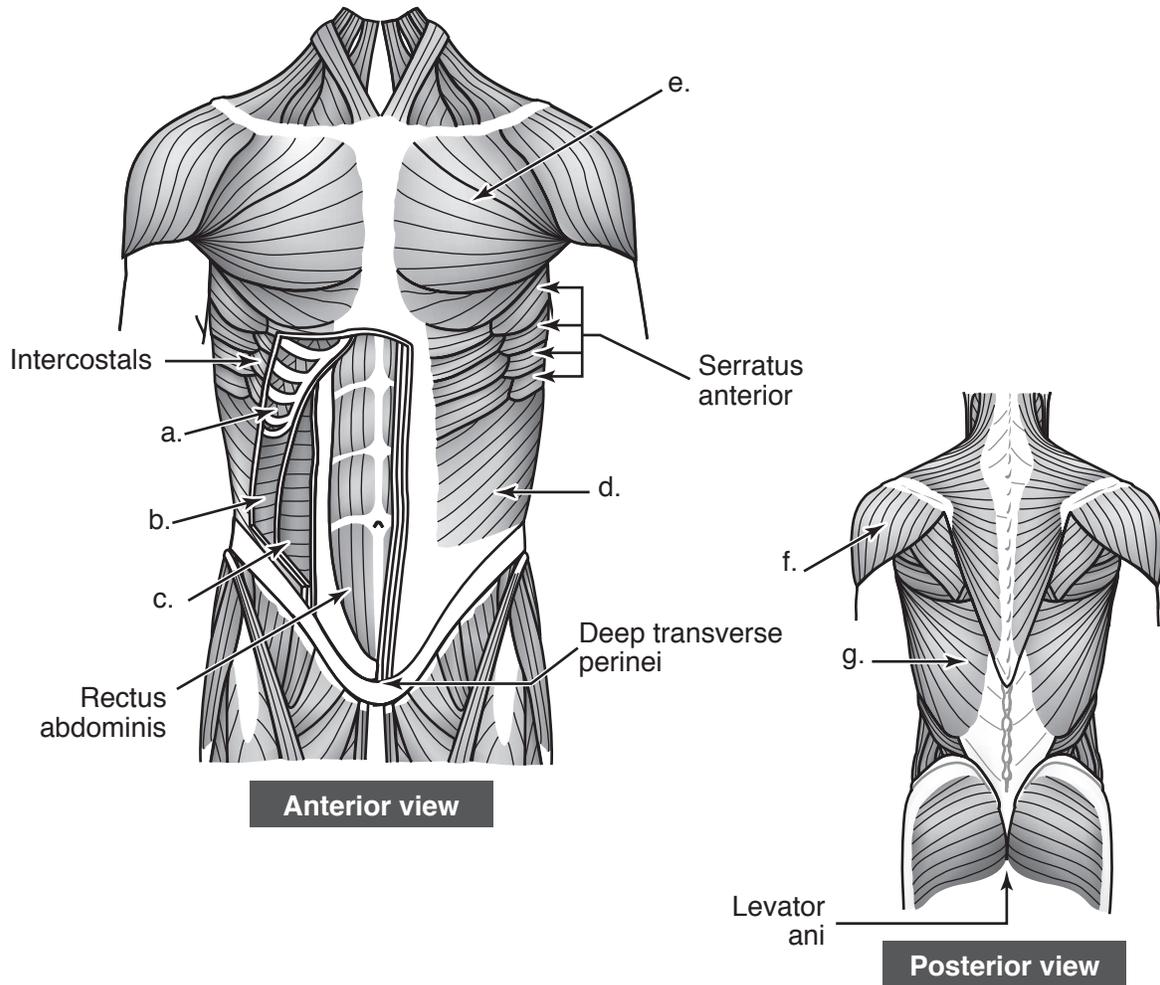
- | | |
|----------------------|------------------------------|
| 1. Deltoid | 7. External/Internal oblique |
| 2. Pectoralis major | 8. Transversus abdominis |
| 3. Serratus anterior | 9. Rectus abdominis |
| 4. Intercostals | 10. Levator ani |
| 5. Latissimus dorsi | 11. Deep transverse perinei |
| 6. Diaphragm | |

- _____ a. Elevate and depress the ribs
- _____ b. Compresses the abdomen and rotates the trunk laterally
- _____ c. Forms the floor of the pelvic cavity and supports the organs
- _____ d. Moves the upper arm at the point of the shoulder
- _____ e. Brings the arms down forcefully
- _____ f. Also forms the floor of the pelvic cavity
- _____ g. Compresses the abdomen and rotates the trunk laterally and flexes the trunk
- _____ h. Contracts and relaxes to cause inhalation and exhalation
- _____ i. Also compresses the abdomen and rotates the trunk laterally
- _____ j. Flexes the upper arm, adducts the upper arm anteriorly, and draws the arm across the chest
- _____ k. Rotates the scapula and raises the shoulder, as in full flexion and abduction of the arm

Written Test

Objective 14

Label major muscles of the torso. Write your answers on the blanks provided under the illustration below.



a. _____
 b. _____
 c. _____
 d. _____

e. _____
 f. _____
 g. _____

Objective 15

Match the major muscles of the arms with their functions. Write the numbers on the blanks provided.

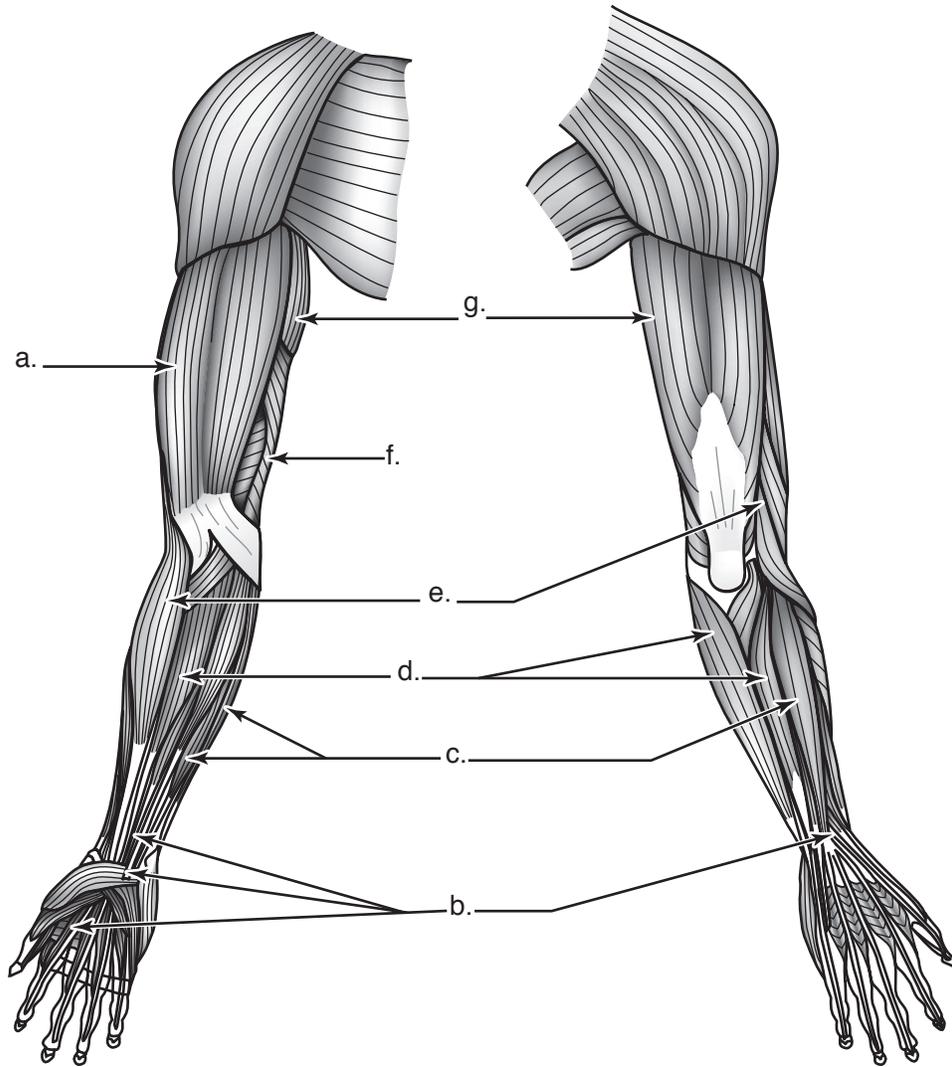
- | | |
|--------------------|----------------------|
| 1. Biceps brachii | 5. Carpi muscles |
| 2. Triceps | 6. Digitorum muscles |
| 3. Brachialis | 7. Pollicis muscles |
| 4. Brachioradialis | |

- _____ a. Control thumb movements
- _____ b. Extends the lower arm
- _____ c. Control hand movements
- _____ d. Flexes the pronated forearm
- _____ e. Control finger movements
- _____ f. Flexes the supinated forearm
- _____ g. Flexes the forearm

Written Test

Objective 16

Label the major muscles of the arms. Write your answers on the blanks provided under the illustration below.



Anterior view

Posterior view

- a. _____
- b. _____
- c. _____
- d. _____

- e. _____
- f. _____
- g. _____

Objective 17

Match the major muscles of the legs with their functions. Write the numbers on the blanks provided.

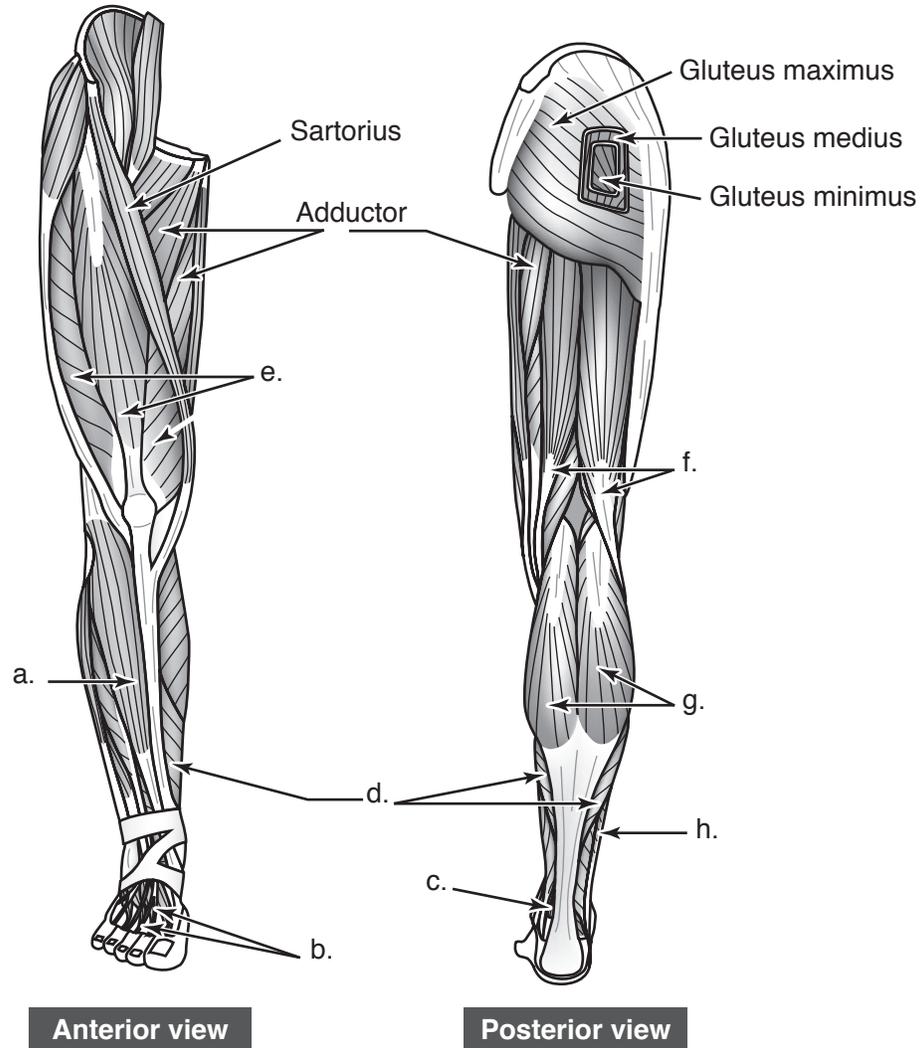
- | | |
|-----------------------|------------------------|
| 1. Gluteus maximus | 8. Gastrocnemius |
| 2. Gluteus medius | 9. Tibialis anterior |
| 3. Gluteus minimus | 10. Peroneus longus |
| 4. Sartorius | 11. Soleus |
| 5. Quadriceps femoris | 12. Flexor digitorum |
| 6. Adductor | 13. Extensor digitorum |
| 7. Hamstring | |

- _____ a. Flexes the lower leg
- _____ b. Adducts and flexes the leg
- _____ c. Flexes the toes
- _____ d. Extends the toes
- _____ e. Helps maintain an erect posture and extends and rotates the thigh
- _____ f. Presses the thighs together
- _____ g. Everts the ankle
- _____ h. Extends the foot
- _____ i. Abducts the thigh, rotates the thigh outward, and stabilizes the pelvis on the femur
- _____ j. Inverts the ankle
- _____ k. Abducts the thigh, rotates the thigh outward, stabilizes the pelvis on the femur, and extends the thigh
- _____ l. Extends the leg
- _____ m. Flexes the foot and inverts the ankle

Written Test

Objective 18

Label major muscles of the legs. Write your answers on the blanks provided under the illustration below.



- Anterior view**
- a. _____
 - b. _____
 - c. _____
 - d. _____

- Posterior view**
- e. _____
 - f. _____
 - g. _____
 - h. _____

*Permission to duplicate this test is granted.

Answers to Written Test

Objective 1	Muscular system—All of the muscles of the body considered as an interrelated structural group
Objective 2	Any four of the following: <ul style="list-style-type: none">a. Assists in body movementsb. Assists in the movement of materials internal to the bodyc. Produces heat and energyd. Assists in maintaining posture and balancee. Helps to protect the internal organs
Objective 3	<ul style="list-style-type: none">a. Vb. Cc. S
Objective 4	<ul style="list-style-type: none">a. 3b. 1c. 2
Objective 5	<ul style="list-style-type: none">a. Originb. Bodyc. Insertion
Objective 6	<ul style="list-style-type: none">a. epimysiumb. contractionc. tendons
Objective 7	<ul style="list-style-type: none">a. electrical shockb. proximalc. bonesd. movementse. relaxesf. pairsg. metabolism
Objective 8	<ul style="list-style-type: none">a. 6b. 2c. 5d. 1e. 4f. 3

Answers to Written Test

Objective 9	a.	3	i.	2
	b.	11	j.	16
	c.	6	k.	9
	d.	5	l.	7
	e.	15	m.	12
	f.	13	n.	14
	g.	1	o.	8
	h.	4	p.	10

Objective 10	a.	5
	b.	6
	c.	2
	d.	1
	e.	3
	f.	4

Objective 11	a.	4
	b.	10
	c.	9
	d.	7
	e.	1
	f.	5
	g.	8
	h.	2
	i.	3
	j.	6

Objective 12	a.	Orbicularis oris
	b.	Platysma
	c.	Trapezius
	d.	Sternocleidomastoid
	e.	Mentalis
	f.	Buccinator
	g.	Masseter
	h.	Orbicularis oculi
	i.	Temporalis
	j.	Frontalis

Objective 13	a.	4
	b.	7
	c.	10
	d.	1
	e.	5
	f.	11
	g.	9
	h.	6
	i.	8
	j.	2
	k.	3

Answers to Written Test

Objective 14

- a. Diaphragm
- b. Internal oblique
- c. Transversus abdominis
- d. External oblique
- e. Pectoralis major
- f. Deltoid
- g. Latissimus dorsi

Objective 15

- a. 7
- b. 2
- c. 5
- d. 3
- e. 6
- f. 1
- g. 4

Objective 16

- a. Biceps brachii
- b. Pollicis muscles
- c. Digitorum muscles
- d. Carpi muscles
- e. Brachioradialis
- f. Brachialis
- g. Triceps brachii

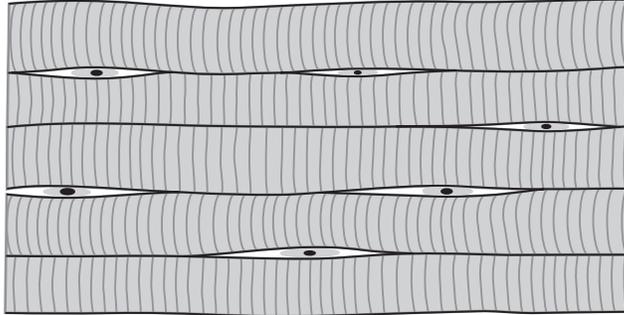
Objective 17

- a. 7
- b. 4
- c. 12
- d. 13
- e. 1
- f. 6
- g. 10
- h. 8
- i. 2
- j. 11
- k. 3
- l. 5
- m. 9

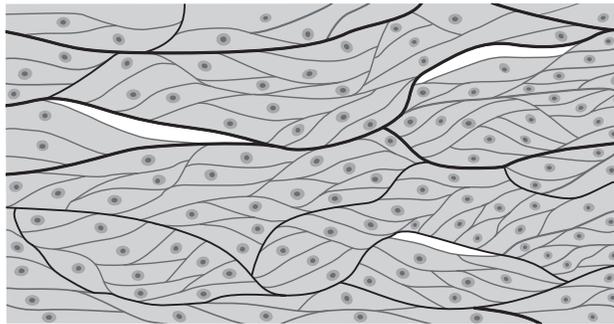
Objective 18

- a. Tibialis anterior
- b. Extensor digitorum
- c. Flexor digitorum
- d. Soleus
- e. Quadriceps femoris
- f. Hamstring
- g. Gastrocnemius
- h. Peroneus longus

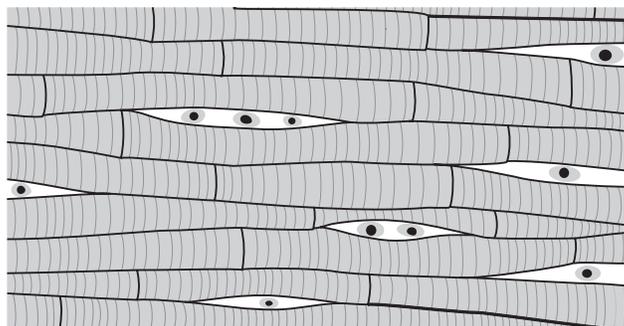
Major Classifications of Muscle Tissue



Skeletal muscle tissue (striated tissue)

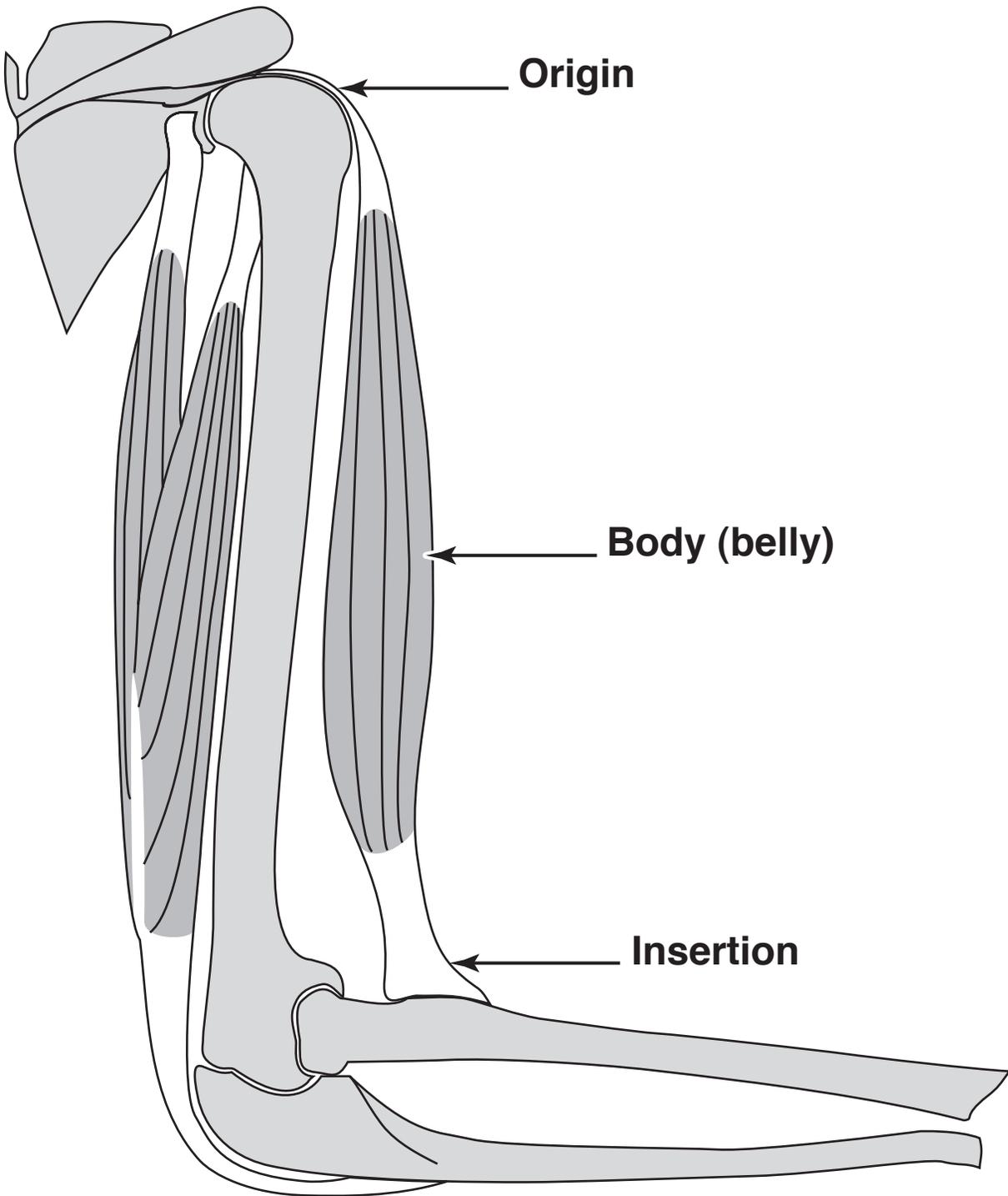


Visceral muscle tissue (smooth tissue)

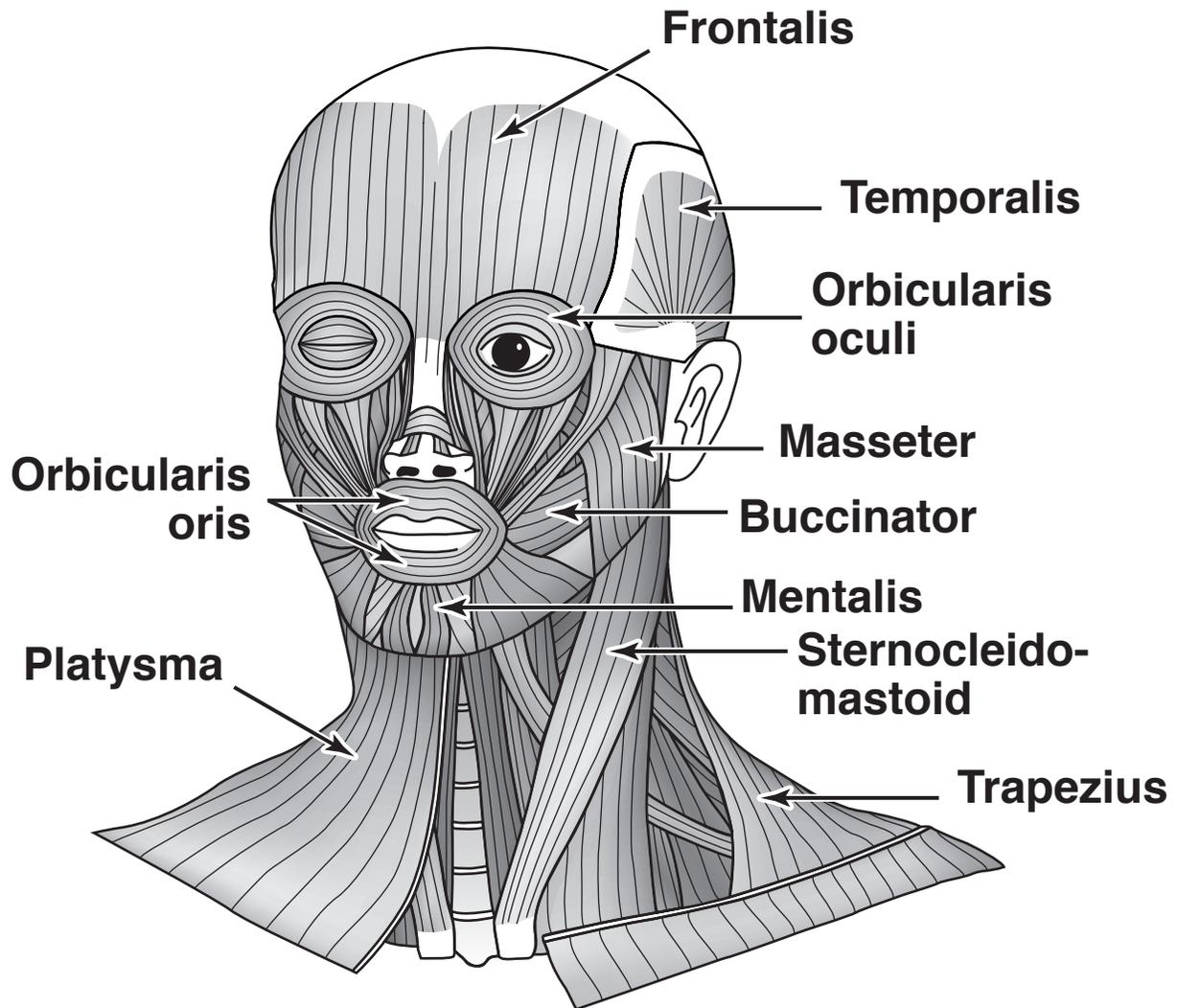


Cardiac muscle tissue (striated tissue)

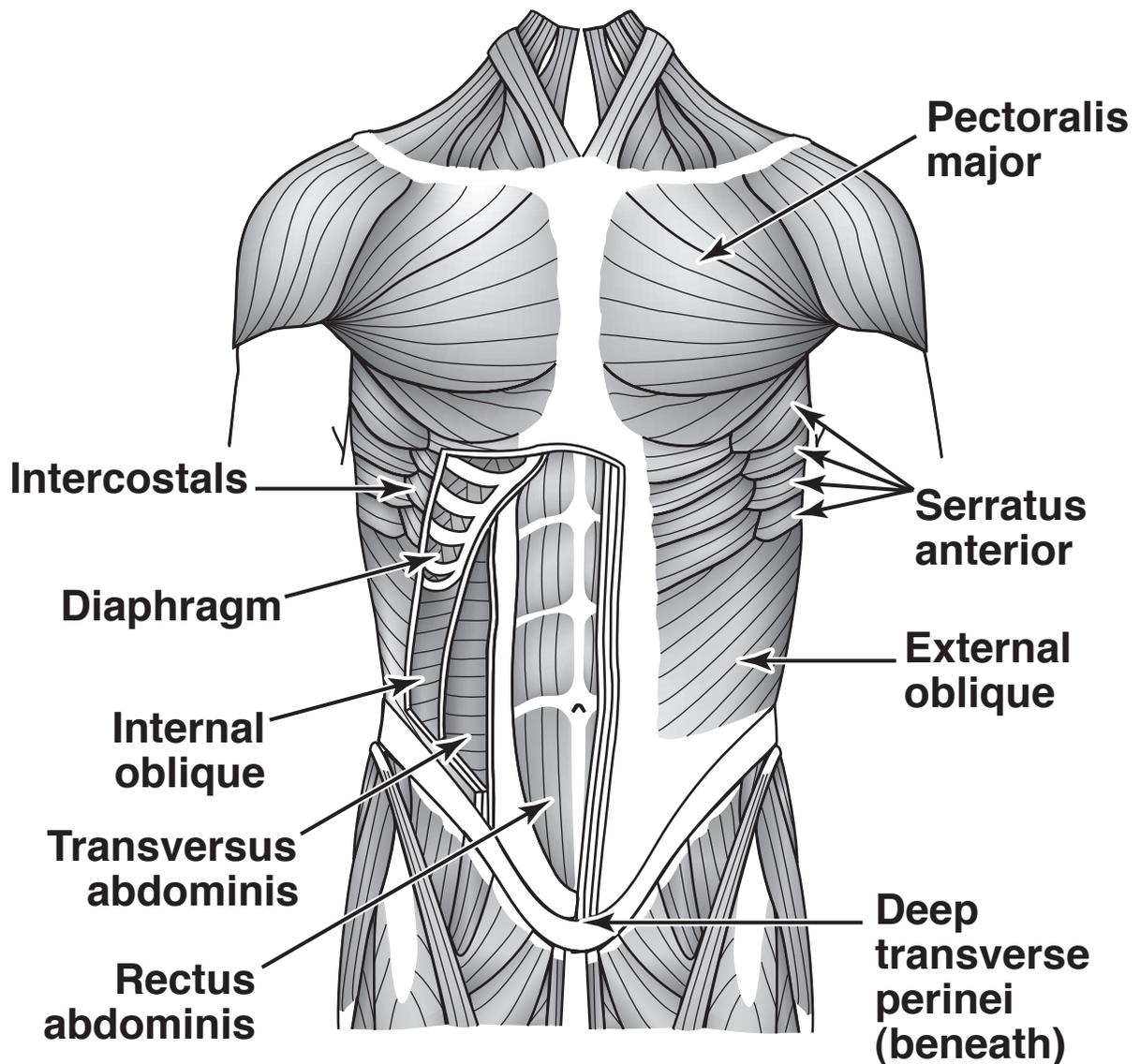
Major Structures of Skeletal Muscles



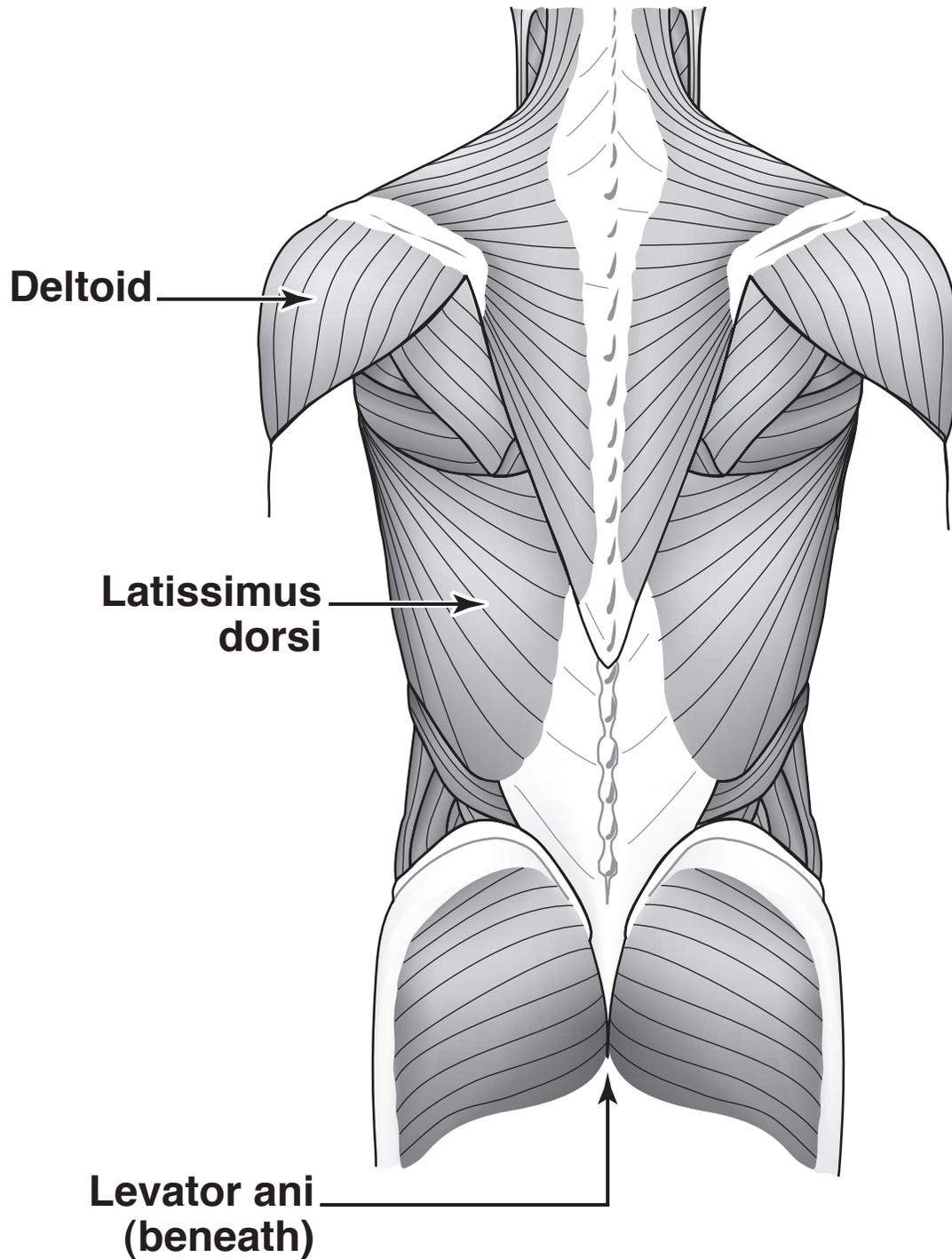
Major Muscles of the Head, Face, and Neck



Major Muscles of the Torso (Anterior View)



Major Muscles of the Torso (Posterior View)

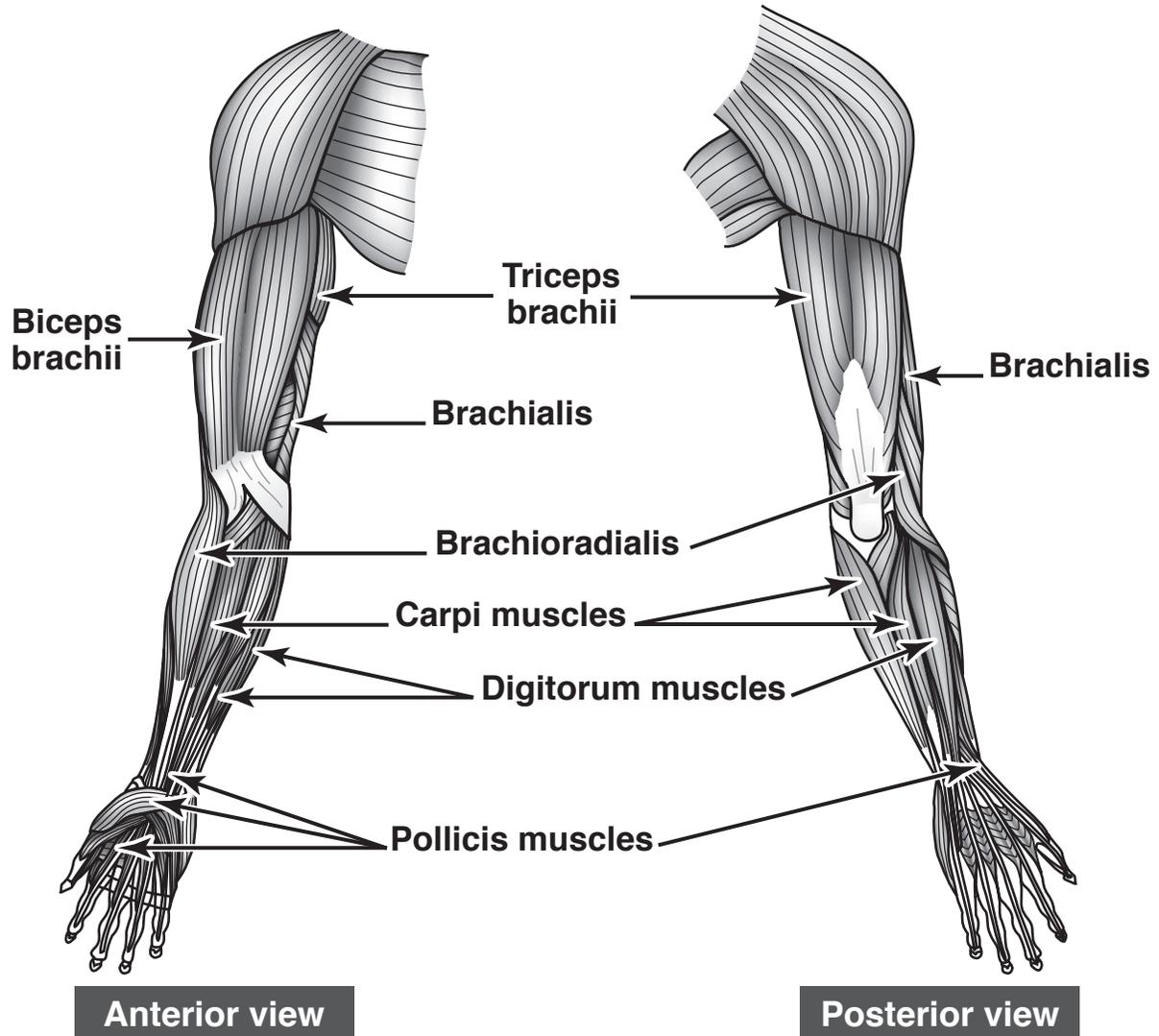


Deltoid

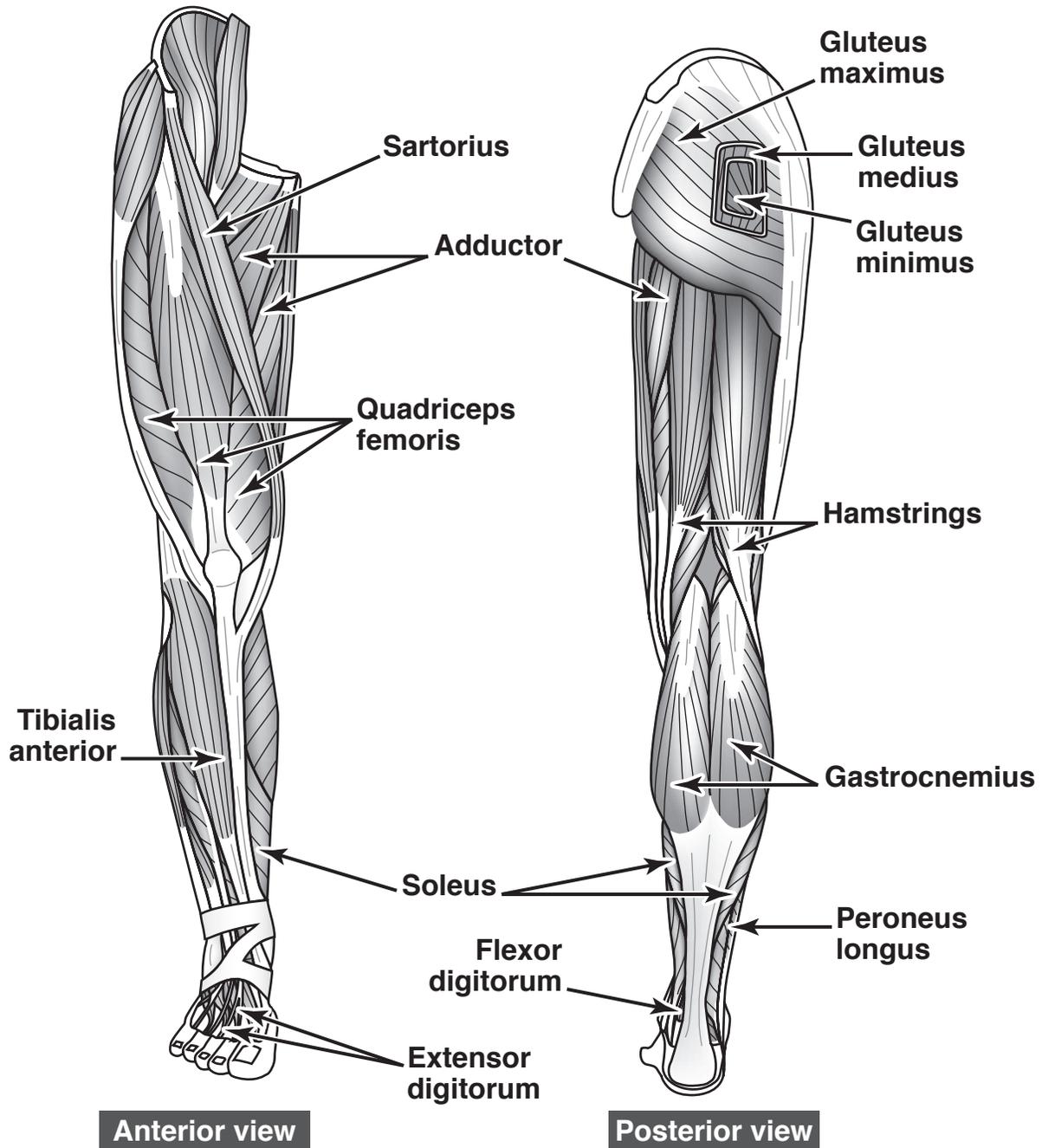
**Latissimus
dorsi**

**Levator ani
(beneath)**

Major Muscles of the Arms



Major Muscles of the Legs



Module Contents

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Instructional Plan

Suggested Activities

Preparation

- Review “Teaching Suggestions.” Plan for classroom activities.
- Plan your presentation to take advantage of student learning styles and to accommodate special-needs students.
- Prepare classroom. Put up posters and charts and display articles and other references related to this module.
- Obtain resources to supplement instruction of this module. See “Resources Used in Developing This Module” and “Suggested Supplemental Resources.”
- Review the “Suggested Web Sites,” and make a list of additional sites you may have found for students to research to learn more about the nervous system.
- For self-paced instruction, review Learning Activities Sheet. Go to “customizable files” link on teacher edition CD and modify as appropriate to include additional activities and/or resources available in your classroom. Make one copy for each student.
- Make copies of Teacher Supplement 1 and any teacher supplements that you have created that will be provided for each student.
- Make transparencies from the transparency masters included in this module. These appear in teacher edition only. A PowerPoint® presentation of transparencies is located on the teacher edition CD.

Delivery and Application

Module Introduction (self-paced instruction)

- Refer student to Learning Activities Sheet and module of instruction located in student guide.
- Review module contents with student.
- Have the student complete the steps in the Learning Activities Sheet.

Module Introduction (group instruction)

- Provide students with module of instruction.
- Discuss module and specific objectives.

Suggested Activities

- Discuss the information sheet. Implement teaching plan to localize, supplement, and personalize the module. Reinforce basic academic and workplace skills when applicable.
- Discuss the assignment sheets. Review with students the criteria for evaluation of these activities.

Teaching Suggestions

- ✓ **Note:** The nervous system is typically one of the more difficult anatomical systems for students to grasp during their studies.
- Use Teacher Supplement 1 with students to help them improve their literacy skills and to learn new subject matter.
- Use crossword puzzle (Assignment Sheet 1) to help reinforce the terms in objectives 1 through 5.
- For Objective 3 through Objective 5, which describe the major subsystems of the nervous system, use Figure 2 and Figure 3 in the student edition to illustrate the descriptions.
- Discuss the role of the autonomic nervous system. Provide the students with information about biofeedback and the apparent involvement of the conscious mind to influence body functions such as blood pressure, heart rate, etc.
- Relate the major structures of a neuron to what students already know about the parts and structure of cells. Point out how the structure of the neuron supports its specialized functioning. Use this discussion to lead into the objective about the functions of the neuron (Objective 8). Relate the functioning of the neuron to an electrical circuit with a battery, pointing out how energy is stored and transmitted. Continue this discussion to cover the types of neurons and their functions in the overall process.
- For Objective 11 describe a reflex arc and explain why reflex arcs offer an advantage and how this pathway differs from normal nerve circuits.
- Use crossword puzzle (Assignment Sheet 2) to help reinforce the terms presented in objectives 6 through 13.
- Use crossword puzzle (Assignment Sheet 3) to help reinforce the terms presented in Objective 14.
- For Objective 14, discuss with the class the importance of knowing the nerves of the head, face, and neck and how the nervous system affects the work of a cosmetologist.
- Read the directions for Assignment Sheet 4 and be prepared to discuss with class. Have the room set up with two rows of chairs facing each other in two straight lines. Make sure there are enough chairs for students.

Suggested Activities

- Use module review (Assignment Sheet 6) to assess student knowledge of the nervous system.

Evaluation

- Make copies of the written test. Using the Word® file included on the teacher edition CD, add or modify test items as needed. The written test serves as both a pretest and posttest to assist in measuring each student's competency gains.
- Give and evaluate pretest. Modify lesson plan to include additional instruction for those areas where students were deficient.
- Evaluate the assignment sheets. Rate the student using the criteria listed on each assignment sheet. See Answers to Assignment Sheets for correct answers where applicable. If the student's performance is unacceptable, have the student review the appropriate materials and complete the assignment again.
- Give and evaluate the posttest.
- Meet individually with students to evaluate their progress through this module of instruction and indicate to them possible areas for improvement.
- Reteach and retest as required.

Resources Used in Developing This Module

Print Media

- *Anatomy and Physiology*. Stillwater, OK: Multistate Academic and Vocational Curriculum Consortium, Inc., 2002.
- Gray, Henry. *Gray's Anatomy*, 39th ed. New York: Mosby, 2004.
- Gylys, Barbara A., and Regina Masters. *Medical Terminology Simplified*, 3rd ed. Philadelphia: F.A. Davis Company, 2005.
- Scanlon, Valerie C., and Tina Sanders. *Essentials of Anatomy and Physiology*, 4th ed. Philadelphia: F.A. Davis Company, 2002.
- Thibodeau, Gary A., and Kevin T. Patton. *Anatomy and Physiology*, 5th ed. St. Louis: Mosby, 2002.

Suggested Supplemental Resources

Print Media

- *Basic Operator*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2006.
- *Basic Esthetician*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.

Suggested Activities

Suggested Web Sites

- *Basic Manicurist*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.
- Forget, Mark A. *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Victoria, British Columbia; Trafford Publishing, 2004.

✓ **Note:** The following web sites offer general information about anatomy and physiology and generally cover more than one body system.

<http://www.ama-assn.org/ama/pub/category/7140.html>

This site provides a wealth of information and many useful graphics about human anatomy.

- <http://www.nsta.org/nerves>

This site has some great interactive simulations of the nervous system and how it functions. It also provides activities for instructors to incorporate into classroom instruction.

- <http://www.hon.nucleusinc.com>

This site provides animations and illustrations and has models and other resources available for purchase to supplement lessons on human anatomy and its regions and body systems.

- <http://en.wikipedia.org/wiki/integumentarysystem>

This site provides great information on the various body systems that make up the human body. To move from one body system to another, simply change the system name in the Web address. For example, change "integumentary" to "muscular" to go to the section of this on-line encyclopedia that addresses that system.

- <http://dir.yahoo.com/science/biology/anatomy>

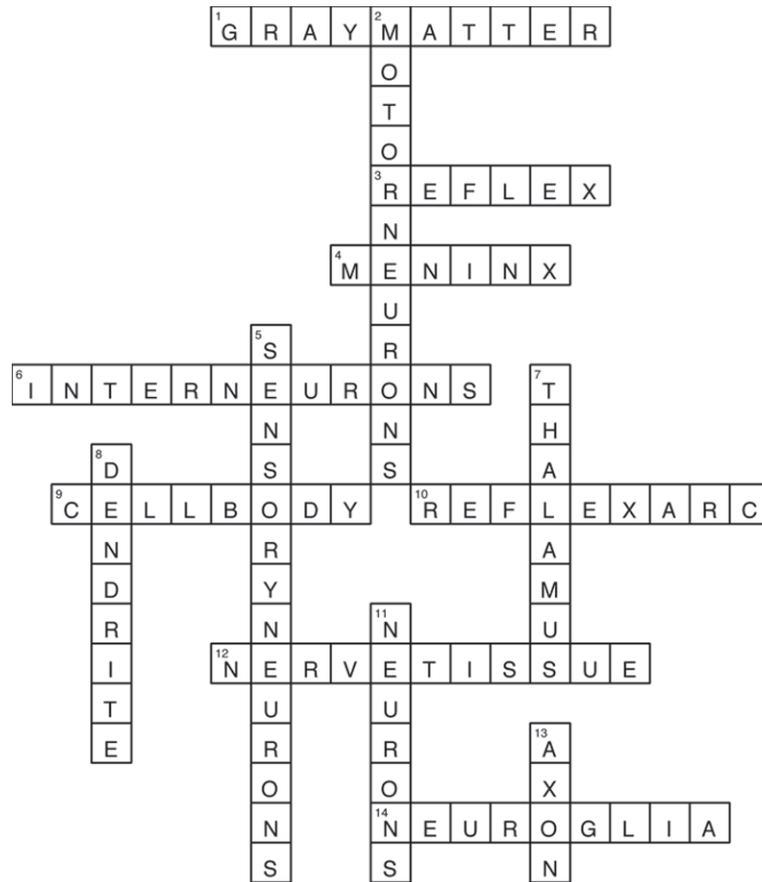
By going to this site, you will have access to a variety of Web addresses that cover the body systems in the human anatomy. Click on the body system you wish to explore to access Web sites that offer good information as well as illustrations to further explore the human body.

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Answers to Assignment Sheets

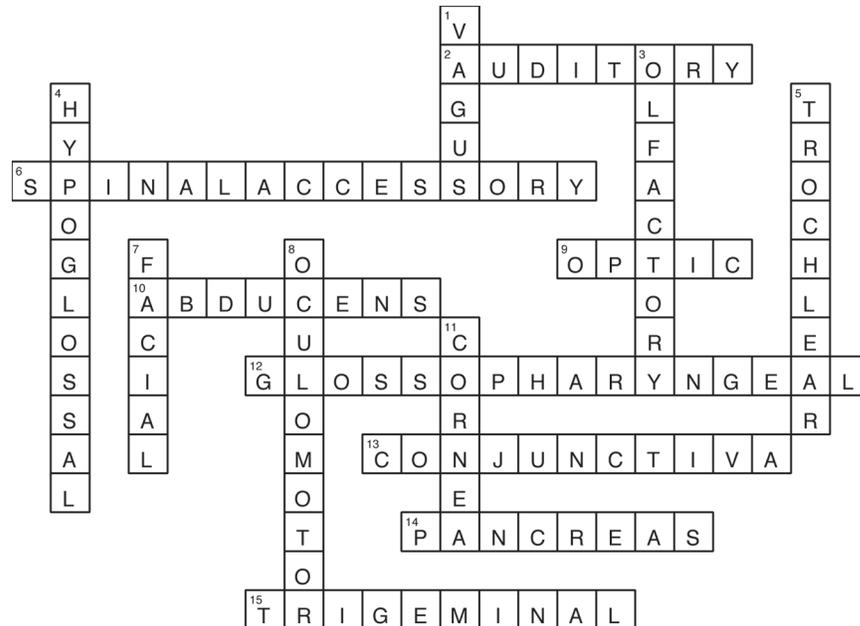
Assignment Sheet 2

Complete the Crossword Puzzle of Terms (Objectives 6–13)



Assignment Sheet 3

Complete the Crossword Puzzle of Terms (Objective 14)



Answers to Assignment Sheets

Assignment Sheet 4

Participate in a "Face Off"

This assignment sheet should be evaluated by the instructor using the evaluation criteria stated on the assignment sheet.

Assignment Sheet 5

Analyze Cosmetology Scenarios

Answers should include key points but may be in the student's own words

Answers to Scenario 1

1. What should you do?

Question Ms. Ramirez to determine where the nerve problem is located and whether the services requested could aggravate her condition. Determine how you should move or not move Ms. Ramirez head while performing the haircut and style. Continue with the requested service.

2. Are there issues connected with the coating or feeling of the hair? What should you do?

Coating of the hair may have occurred because of the medicine that Ms. Ramirez has been taking. Ask Ms. Ramirez if her style usually holds well. If not, style her hair with the blow dryer in the direction the hair is to flow once styled. Adjust the temperature of the curling iron to a hotter temperature. Continue with the service.

Answers to Scenario 2

1. What subsystem of the nervous system could be involved?

Autonomic nervous system

2. What should you do?

✓ **Note:** Remember, do not offer a diagnosis as that is the responsibility of a physician.

Reassure Mr. Bunch. Continue the service.

3. What precautions should you take?

Position your hand around the face when holding the hair and using the scissors to protect Mr. Bunch's eyes (much like when you are giving a hair cut to a child.). Continue the service.

Answers to Assignment Sheets

Assignment Sheet 6

Answers to Module 8 Review

- | | | | |
|-----|---|-----|---|
| 1. | d | 15. | d |
| 2. | b | 16. | a |
| 3. | b | 17. | d |
| 4. | b | 18. | d |
| 5. | b | 19. | c |
| 6. | a | 20. | c |
| 7. | c | 21. | b |
| 8. | b | 22. | a |
| 9. | c | 23. | d |
| 10. | a | 24. | b |
| 11. | c | 25. | d |
| 12. | d | 26. | c |
| 13. | c | 27. | a |
| 14. | a | 28. | b |

Written Test

Name _____

Date _____ Score _____

Objective 1

Define the term *nervous system*. Write your answer on the blank lines provided beside the term below.

Nervous system _____

Objective 2

State three functions of the nervous system. Write your answers on the blank lines provided below.

a. _____

b. _____

c. _____

Objective 3

Distinguish between the major subsystems of the nervous system. Write a "P" on the blank next to the description of the peripheral nervous system.

_____ a. The part of the nervous system that consists of the brain and spinal cord, to which sensory impulses are transmitted and from which motor impulses pass out

_____ b. The part of the nervous system that consists of 12 pairs of cranial nerves and 31 pairs of spinal nerves that link the various parts of the body

Written Test

Objective 4

Describe the major subsystems of the peripheral nervous system (PNS). Write your answers on the blank lines provided beside each of the terms below.

a. Somatic nervous system (SNS) _____

b. Autonomic nervous system (ANS) _____

Objective 5

Distinguish between the major subsystems of the autonomic nervous system (ANS). Write an "S" on the blank next to the description of the sympathetic nervous system.

_____ a. The part of the autonomic nervous system that prepares the body to deal with emergencies through the expenditures of energy

_____ b. The part of the autonomic nervous system that restores homeostatic balance and conserves energy

Objective 6

Define the term *nerve tissue*. Write your answer on the blank lines provided beside the term below.

Nerve tissue _____

Objective 7

Describe the basic types of nerve tissue. Write your answers on the blank lines provided beside each of the terms below.

a. Neurons _____

b. Neuroglia _____

Written Test

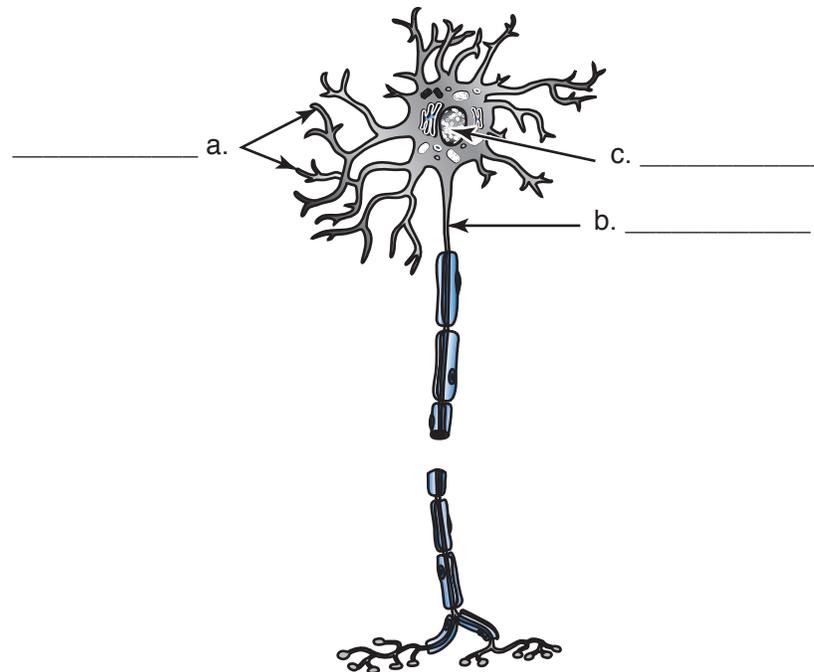
Objective 8

Distinguish among the major structures of a neuron. Write a “C” on the blank next to the function of the cell body, a “D” next to the function of the dendrite, and an “A” next to the function of the axon.

- _____ a. Carries impulses to the cell body
- _____ b. Acts as a sending and receiving center, performs metabolic and reproductive functions for the cell, and stores energy
- _____ c. Carries impulses from the cell body

Objective 9

Label the major structures of a neuron. Write your answers on the blank lines provided beside the illustration below.



Objective 10

Match types of neurons with their descriptions. Write the numbers on the blanks provided. Numbers will be used more than once. Definitions continue on the next page.

1. Sensory neurons 2. Interneurons 3. Motor neurons

- _____ a. Are controlled by the frontal lobe of the brain
- _____ b. Conduct messages or impulses from sensory to motor neurons
- _____ c. Transmit messages from the central nervous system to all parts of the body
- _____ d. Are also called *afferent* or *receptor neurons*

Written Test

- _____ e. Are found only in the central nervous system (brain and spinal cord)
- _____ f. Are controlled by the thalamus
- _____ g. Are located in the muscles and glands
- _____ h. Are also called *central neurons* or *internuncial neurons* or *connecting neurons*
- _____ i. Are also called *efferent neurons*
- _____ j. Receive messages from all parts of the body and transmit them to the central nervous system (brain and spinal cord)

Objective 11

Complete statements that describe a reflex arc. Write your answers on the blank lines provided in the statements below.

- a. A reflex is an involuntary response to a _____, such as blinking the eyes when something approaches them, salivating at the sight of appetizing food, and jerking of the knee when a certain spot is tapped.
- b. Many reflexes do not involve action on part of the _____; instead, the affector/effector circuit is completed by a loop in the spinal cord called a reflex arc.
- c. A reflex arc consists of an _____ that provides a signal through a sensory neuron into a spinal nerve and into the spinal cord.
- d. The impulse passes through an interneuron in the _____ of the spinal cord to a motor neuron that connects to an effector.

Objective 12

List the major structures within the spinal canal. Write your answers on the blank lines provided below.

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____

Objective 13

Complete statements that describe the structure and function of the spinal cord. Write your answers on the blank lines provided in the statements below.

- a. The spinal cord is a small cord about _____ inches long in an adult.
- b. The spinal cord lies within the _____ and is surrounded by the vertebrae.
- c. The spinal cord acts as the conduction pathway for impulses between the _____ nerves to and from the brain.
- d. The spinal cord extends from the _____ of the brain to the first lumbar vertebra or top of the second lumbar vertebra.

Objective 14

Match nerves of the head, face, and neck with their functions. Write the numbers on the blanks provided.

- | | | |
|---------------|---------------|----------------------|
| 1. Olfactory | 5. Trigeminal | 9. Glossopharyngeal |
| 2. Optic | 6. Abducens | 10. Vagus |
| 3. Oculomotor | 7. Facial | 11. Spinal accessory |
| 4. Trochlear | 8. Auditory | 12. Hypoglossal |

- _____ a. Control lateral eye movement
- _____ b. Support the sense of smell
- _____ c. Control the tongue muscles
- _____ d. Control four muscles of the eye
- _____ e. Support the sense of hearing and balance
- _____ f. Control some of the eye muscles
- _____ g. Support the sense of sight
- _____ h. Control the muscles of the neck and upper back; carry impulses to the neck and shoulder muscles
- _____ i. Support the sense of taste and control swallowing
- _____ j. Control the muscles of the cornea and conjunctiva, the upper portion of the face, the ear, the lower lip, the teeth, the gums, and muscles for chewing
- _____ k. Supply the face muscles, the middle ear, and the taste sensors
- _____ l. Control swallowing, hunger, speech, breathing, heart rate, and glands in the stomach and pancreas

*Permission to duplicate this test is granted.

Answers to Written Test

Objective 1	Nervous system—The extensive intricate network of structures that activates, coordinates, and controls all of the functions of the body
Objective 2	Any three of the following in any order: <ol style="list-style-type: none">Receives internal and external stimuli through the sensory organsTransmits messages to and from the brainInterprets the transmitted messages, stores any needed information, and coordinates any required responsesResponds to internal and external stimuli through the motor organs
Objective 3	b
Objective 4	<ol style="list-style-type: none">Somatic nervous system—The part of the peripheral nervous system that connects the central nervous system to the skin and the skeletal muscles via the cranial and spinal nerves and initiates voluntary responsesAutonomic nervous system—The part of the peripheral nervous system that connects the central nervous system to the visceral organs via the cranial and spinal nerves and initiates involuntary responses
Objective 5	a
Objective 6	Nerve tissue—Tissue consisting of one or more bundles of impulse-carrying fibers that connect the brain and the spinal cord with other parts of the body
Objective 7	<ol style="list-style-type: none">Neurons—The basic nerve-tissue cells that are capable of transmitting nerve impulsesNeuroglia—The basic nerve-tissue cells that support neurons and play a role when there is injury or infection in the nervous system
Objective 8	<ol style="list-style-type: none">DCA
Objective 9	<ol style="list-style-type: none">DendritesAxonCell body

Answers to Written Test

Objective 10

- a. 3
- b. 2
- c. 3
- d. 1
- e. 2
- f. 1
- g. 3
- h. 2
- i. 3
- j. 1

Objective 11

- a. stimulus
- b. brain
- c. effector
- d. gray matter

Objective 12

Answers may be in any order:

- a. Spinal cord
- b. Cerebrospinal fluid
- c. Meninges
- d. Adipose tissue
- e. Blood vessels

Objective 13

- a. 18
- b. spinal canal
- c. peripheral
- d. medulla

Objective 14

- a. 6
- b. 1
- c. 12
- d. 3
- e. 8
- f. 4
- g. 2
- h. 11
- i. 9
- j. 5
- k. 7
- l. 10

Teacher Supplement 1 – Complete an Anticipation Guide

Evaluation Criteria	Rating
• Completion of guide before reading	_____
• Review of completed guide after reading	_____
• Group participation and discussion	_____
• Classroom discussion	_____

Basic Skills



Directions Part 1

Before reading the materials provided and in the space to the left of each statement, place a check mark (✓) if you agree or think the statement is true.

- _____ 1. The nervous system controls stimulus to the nerve endings.
- _____ 2. External environmental factors and internal environmental conditions cause responses in other body systems.
- _____ 3. The brain contains specialized cells that coordinate and regulate functions of the central nervous system. The brain processes messages, stores memories, and initiates responses in the body, both voluntary and involuntary.
- _____ 4. Motor organs are an essential part of the nervous system.
- _____ 5. Sensory organs include the eyes, ears, taste buds, nerve endings in the skin, and receptors in the nasal passages.
- _____ 6. Sub-systems of the nervous system include the brain and spinal cord and cranial and spinal nerves.
- _____ 7. Jerking your hand away from a hot curling iron is initiated by the autonomic nervous system (ANS).
- _____ 8. Bundles of fibers that are impulse-carrying and connect the brain and the spinal cord with other parts of the body are called "nerve tissue."
- _____ 9. Nerve tissue cells that transmit nerve impulses are referred to as "neurons."
- _____ 10. Gray matter is located in the brain.

Teacher Supplement 1

Directions Part 2

During or after reading: add a new check mark or cross through the check marks on those statements about which you have changed your mind. You may have to put some thought into your answers. This is not an assignment where you can hunt and find the answers verbatim in the materials. Use the space under each statement to note where you found the information to support your thinking.

✓ **Note:** You may find information in several locations to support your thinking. Be prepared to defend your answers.

Directions Part 3

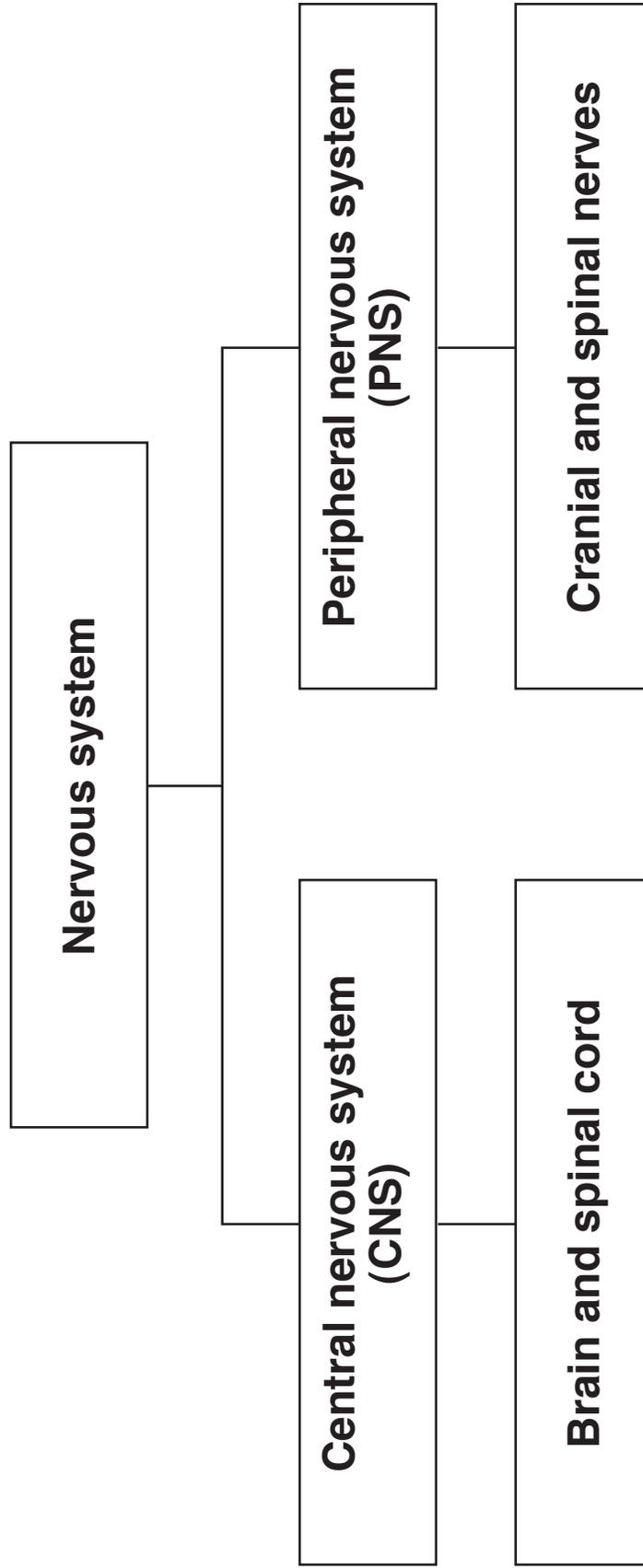
Join your team to defend your beliefs. Determine those statements that each member of the team believed to be a true statement. Using your notes written under each statement, discuss the statements that all members of the team did not agree were true and come to a group consensus.

Directions Part 4

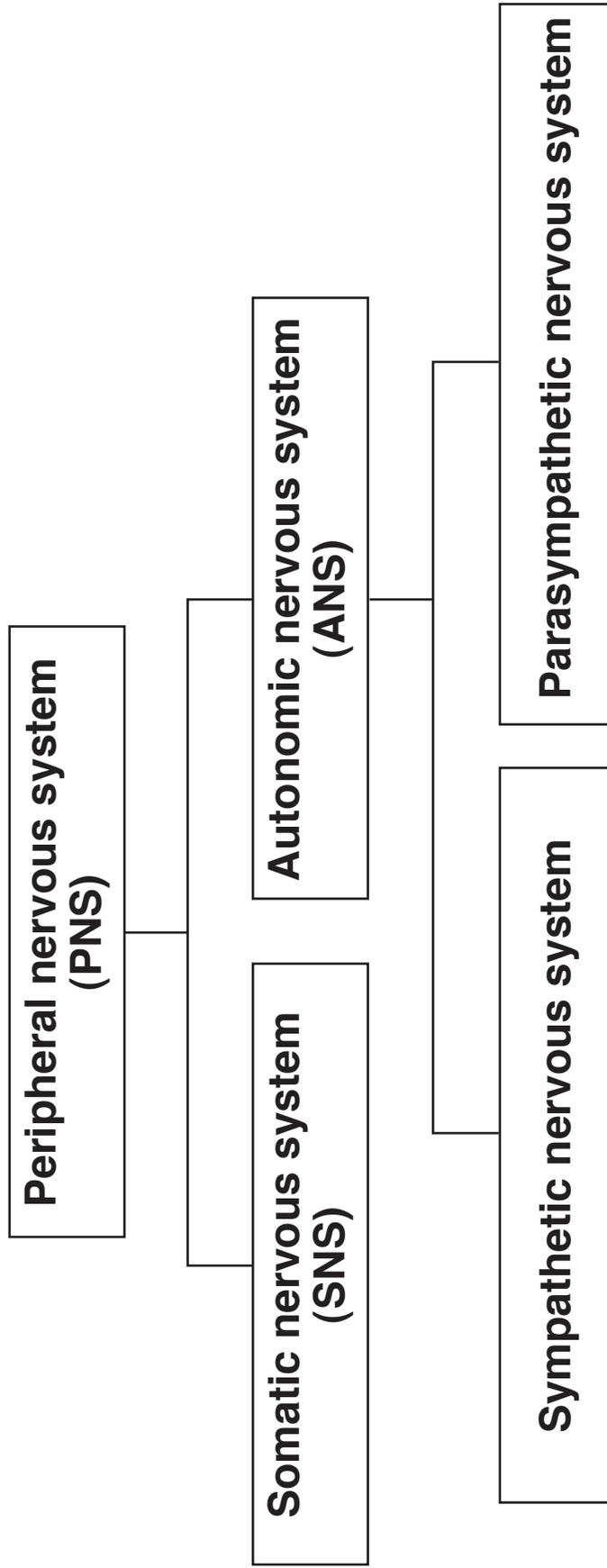
Share group results with the entire class as directed by the teacher.

Adapted from *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Mark A. Forget, Ph.D., ©2004.

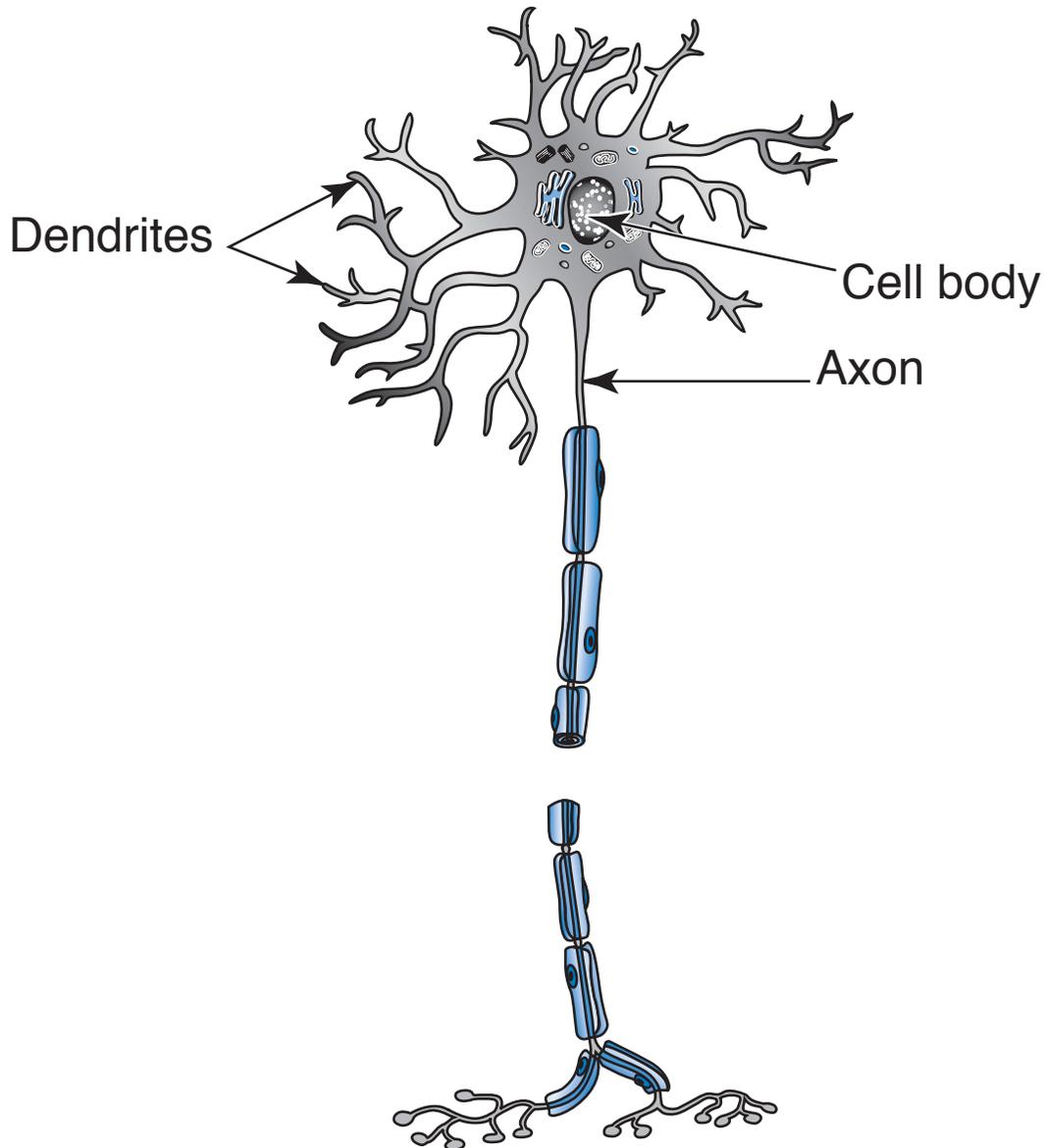
Major Subsystems of the Nervous System



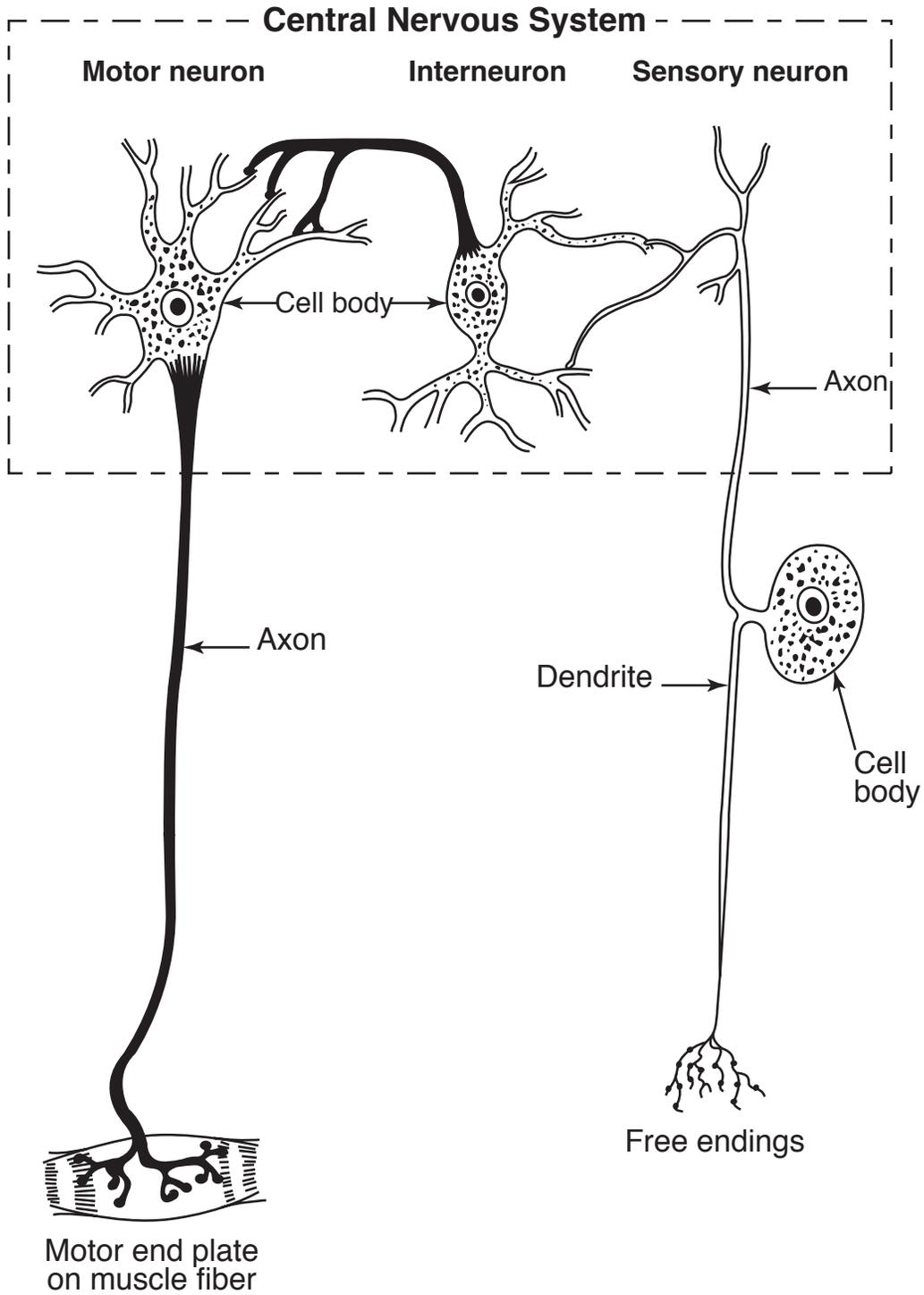
Major Subsystems of the Peripheral Nervous System



Major Structures of a Neuron

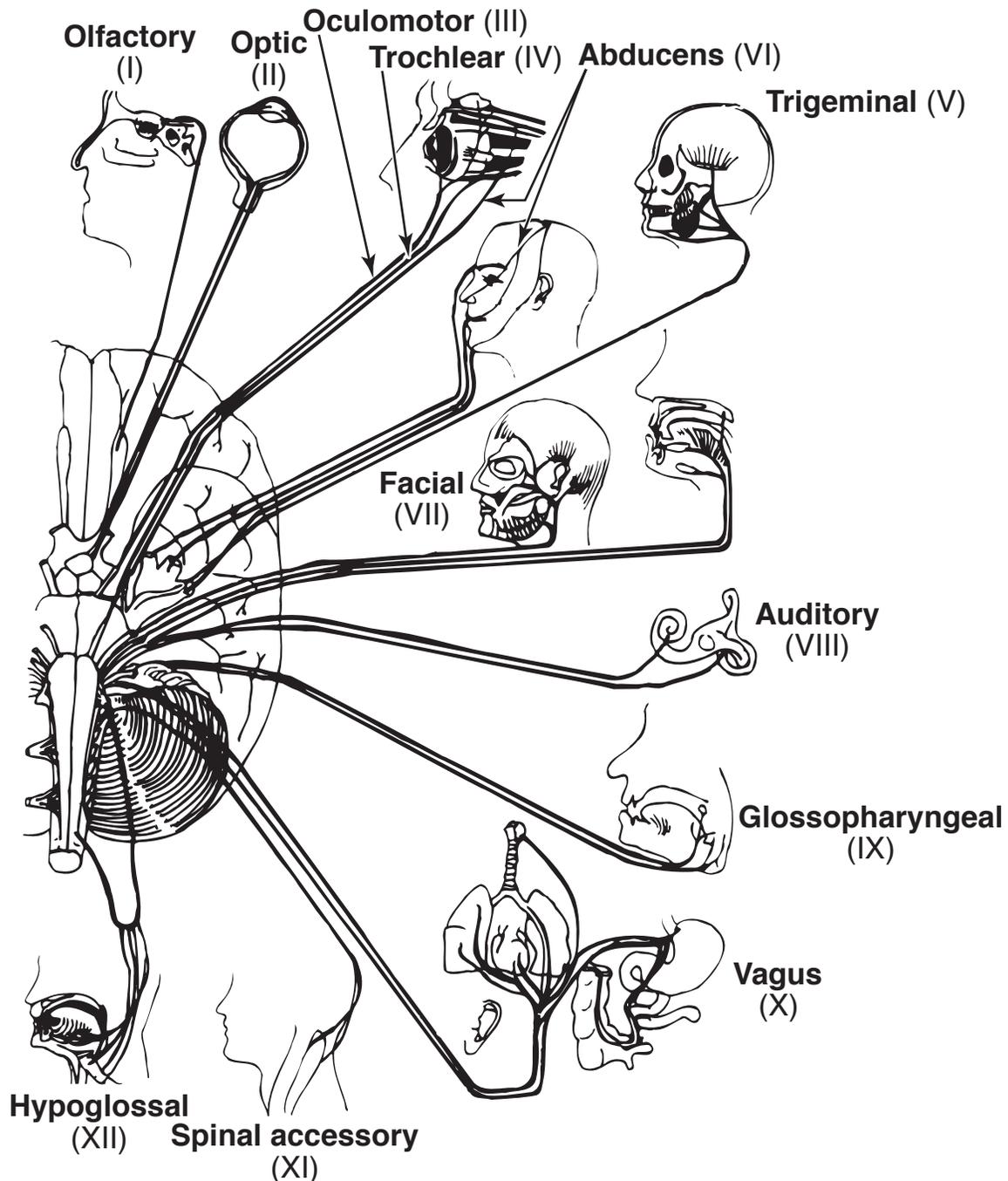


Types of Neurons



Nerves of the Head, Face, and Neck

(The Cranial Nerves of the Peripheral Nervous System)



✓ **Note:** The brain is shown in relation to the cranial nerves.

Module Contents

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	3—Composition of Blood	9–33
	4—Major Structures of the Heart.	9–35
5—Major Arteries of the Systemic Circulation System	9–37	
6—Common Pulse Points	9–39	
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		Student Guide
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	* Assignment Sheets are located in the Student Workbook.	

Instructional Plan

Suggested Activities

Preparation

- Read the module carefully and plan for instruction.
- Review “Teaching Suggestions.” Plan for classroom activities.
- Plan your presentation to take advantage of student learning styles and to accommodate special-needs students.
- Prepare classroom. Put up posters and charts and display articles and other references related to this module.
- Obtain resources to supplement instruction of this module. See “Resources Used in Developing This Module” and “Suggested Supplemental Resources.”
- Review the “Suggested Web Sites,” and make a list of additional sites you may have found for students to research to learn more about the circulatory system.
- For self-paced instruction, review Learning Activities Sheet. Go to “customizable files” link on teacher edition CD and modify as appropriate to include additional activities and/or resources available in your classroom. Make one copy for each student.
- Make copies of Teacher Supplement 1 and any teacher supplements that you have created that will be provided for each student.
- Make transparencies from the transparency masters included in this module. These appear in teacher edition only. A PowerPoint® presentation of transparencies is located on the teacher edition CD.

Delivery and Application

Module Introduction (self-paced instruction)

- Refer student to Learning Activities Sheet and module of instruction located in student guide.
- Review module contents with student.
- Have the student complete the steps in the Learning Activities Sheet.

Module Introduction (group instruction)

- Provide students with module of instruction.

Suggested Activities

- Discuss module and specific objectives.
- Discuss the information sheet. Implement teaching plan to localize, supplement, and personalize the module. Reinforce basic academic and workplace skills when applicable.
- Discuss the assignment sheets. Review with students the criteria for evaluation of these activities.

Teaching Suggestions

- ✓ **Note:** This module provides an introduction to the circulatory system, including blood, cardiac, vascular and lymphatic systems. It is important for students to understand how these areas are interrelated and how they function to support the human body.
- Use Teacher Supplement 1 with students to help them improve their literacy skills and to learn new subject matter.
- To introduce this module and Objective 1 through Objective 3, provide the students with an overview of the circulatory system, including lymphatics, using illustrations and models. The preceding modules have prepared the students for the vast integration of physiological functioning that will be presented in this module in the circulatory system's role in carrying nutrients, wastes, hormones and other chemicals, and gases. Discuss these roles and relate them to concepts that the students have mastered.
- To supplement Objective 5 through Objective 7, discuss the components of blood. Provide prepared slides of blood cells. Continue your discussion to include the physical and chemical characteristics of blood.
- Use crossword puzzle (Assignment Sheet 1) to help reinforce the terms in objectives 1 through 7.
- For Objective 8, discuss the term *cardiovascular system*. Discuss the major roles of the principal structures.
- Continue the discussion with Objective 9 to describe the physical characteristics of the heart. Encourage the students to locate the mediastinum, diaphragm, midline, second rib, and other anatomical references. You may wish to provide the students with an outline drawing of a human body with the skeletal structure and have the students draw the heart based on the description that you provide them.
- Begin your presentation of Objective 11 through Objective 15 using Figure 2 or other suitable drawings of the heart. Point out the structures of the heart and describe their functions generally as presented.

Suggested Activities

- Use crossword puzzle (Assignment Sheet 2) to help reinforce the terms presented in objectives 8 through 24.
- For Assignment Sheet 3, obtain materials for students to use in constructing their model of the human heart. Construction paper and clay are inexpensive. A 3-D modeling computer program is another tool for students to use in constructing their models. Allow time for students to present their models and findings to class.
- To supplement Objective 20, discuss the structure and functions of capillaries. Help the students to understand the overall concept of circulation based on their knowledge of arteries, veins, and capillaries. Demonstrate osmosis. One method is to use colored water and show how it travels into a sponge or celery stick.
- For Assignment Sheet 4, select a graphic organizer for students to use if other than one provided in assignment. Determine the length and style of paper to be written by students, and make arrangements for students to have access to a computer to write their paper.
- Discuss pulse points and the differences between resting pulse and pulse after exercise. Explain how checking pulse points can be useful in evaluating a client's health in case of an emergency.
- Discuss blood pressure and the normal fluctuations in blood pressure during the day.
- Use module review (Assignment Sheet 6) to assess student knowledge of the circulatory system.

Evaluation

- Make copies of the written test. Using the Word® file included on the teacher edition CD, add or modify test items as needed. The written test serves as both a pretest and posttest to assist in measuring each student's competency gains.
- Give and evaluate pretest. Modify lesson plan to include additional instruction for those areas where students were deficient.
- Evaluate the assignment sheets. Rate the student using the criteria listed on each assignment sheet. See Answers to Assignment Sheets for correct answers where applicable. If the student's performance is unacceptable, have the student review the appropriate materials and complete the assignment again.
- Give and evaluate the posttest.
- Meet individually with students to evaluate their progress through this module of instruction and indicate to them possible areas for improvement.
- Reteach and retest as required.

Suggested Activities

Resources Used in Developing This Module

Print Media

- *Anatomy and Physiology*. Stillwater, OK: Multistate Academic and Vocational Curriculum Consortium, Inc., 2002.
- Gray, Henry. *Gray's Anatomy*, 39th ed. New York: Mosby, 2004.
- Gyls, Barbara A., and Regina Masters. *Medical Terminology Simplified*, 3rd ed. Philadelphia: F.A. Davis Company, 2005.
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- Forget, Mark A. *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Victoria, British Columbia; Trafford Publishing, 2004.

Suggested Web Sites

✓ **Note:** The following web sites focus on the circulatory system. Internet references in earlier modules focus on general anatomy and physiology and may also help support this module.

- <http://sln.fi.edu/biosci/biosci.html>

This site allows students to explore the heart, its structure, and its development and the flow of blood, and its relationship to other body systems. The site also presents information about heart health.

- <http://www.msms.doe.k12.ms.us/biology/anatomy/circulatory/circulatory.html>

This site provides good information about the heart, blood vessels, and conduction within the heart.

Suggested Activities

- <http://www.cln.org/themes/circulatory.html>

This web page provides a number of links to sites related to the heart and circulatory system.

- <http://www.stayhealthy.com>

This site provides links to other sites that provide information about heart health.

- <http://www.americanheart.org>

This is the American Heart Association's site. It offers several interactive pages and lots of good information.

- <http://en.wikipedia.org/wiki/integumentarysystem>

This site provides great information on the various body systems that make up the human body. To move from one body system to another, simply change the system name in the Web address. For example, change "integumentary" to "muscular" to go to the section of this on-line encyclopedia that addresses that system.

- <http://dir.yahoo.com/science/biology/anatomy>

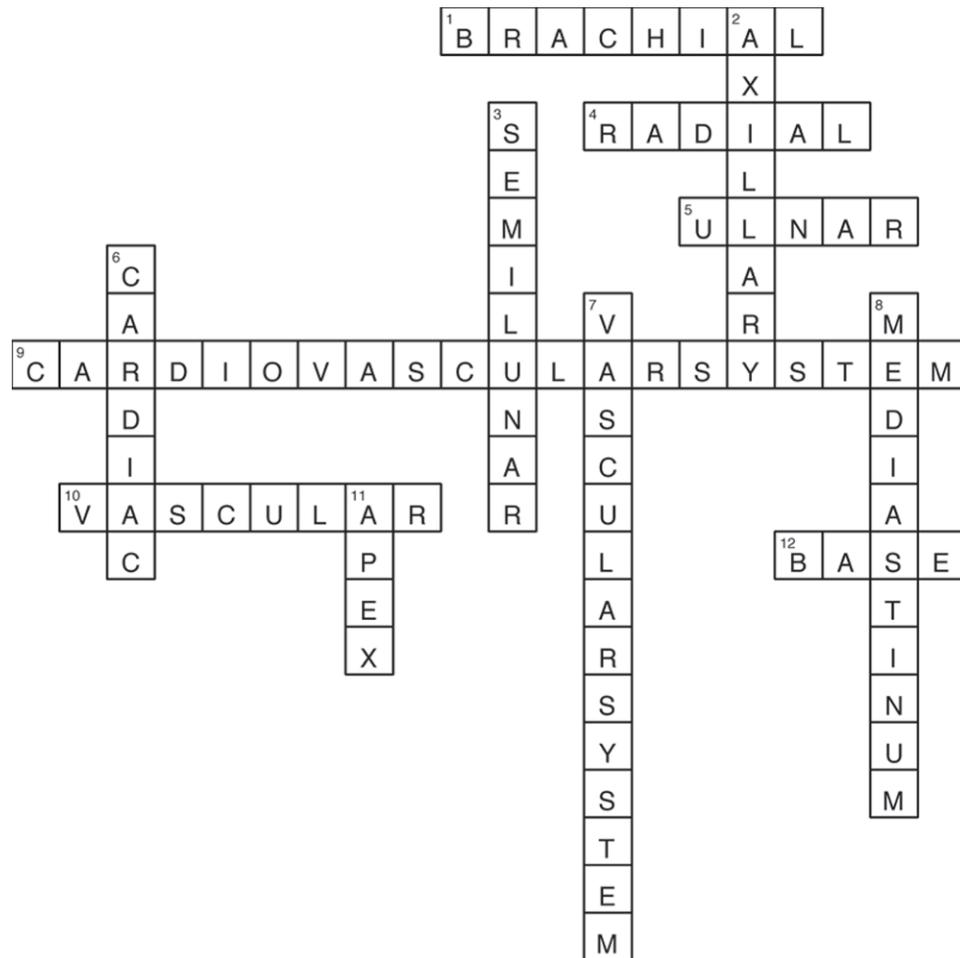
By going to this site, you will have access to a variety of Web addresses that cover the body systems in the human anatomy. Click on the body system you wish to explore to access Web sites that offer good information as well as illustrations to further explore the human body.

- ✓ **Note:** Web-site addresses were accurate and all content on referenced web sites was appropriate during development and production of this product. However, web sites sometimes change; MAVCC takes no responsibility for a site's content. The inclusion of a web site does not constitute an endorsement of that site's other pages, products, or owners. You are encouraged to verify all web sites prior to use.

Answers to Assignment Sheets

Assignment Sheet 2

Complete the Crossword Puzzle of Terms (Objectives 8–24)



Assignment Sheet 3

Construct a Model of the Human Heart

This assignment to be evaluated by the instructor using the evaluation criteria stated on the assignment sheet.

Assignment Sheet 4

Research the Route of a Blood Cell Through the Circulatory System

This assignment to be evaluated by the instructor using the evaluation criteria stated on the assignment sheet.

Answers to Assignment Sheets

Assignment Sheet 5

Analyze Cosmetology Scenarios

Answers should include key points but may be in the student's own words.

Answers to Scenario 1

1. What could cause the blue color?

Poor blood circulation

2. What should you do?

Question Mr. Turner concerning the blue color at the base of Apple's nails. Refer them to a physician if they are not presently in the care of one. Do not massage the hands. Adjust the pressure of everything you do in the manicure to very gentle. Adjust the temperature of the oil or water to warm or cool). Ask Apple if the temperature is comfortable. If Apple feels any discomfort, adjust the manicure to polish only.

Answers to Scenario 2

What should you do?

Explain that the burse on the leg is very dangerous and recommend that Ms. Buckingham see her physician immediately. Explain that you cannot perform a pedicure on her right leg without a statement from her physician. Explain that you cannot use the vibration on the pedicure chair or foot bath even on the left leg as not to aggravate the condition. Explain that you will file the toe nails because it is not in Ms. Buckingham's best interest to use the clippers. Use a warm to cool water temperature in the footbath. Be gentle with the left leg and foot. Continue the pedicure on the left leg only with light massage. Ask Ms. Buckingham to check with her physician to determine if weekly pedicures would help improve the circulation in her legs and feet. If you are in doubt about giving the pedicure, refer Ms. Buckingham to her physician for a statement prior to giving a service.

Answers to Scenario 3

1. What could cause the ridge across the forehead?

Tight muscles have caught the blood vessels and are not letting the blood flow sufficiently.

2. What should you do?

Continue with the massage. Begin with a head massage. Massage the neck and shoulders. Massage the face. Refer Mr. Santos to a physician.

Answers to Assignment Sheets

Assignment Sheet 6

Complete Module 9 Review

- | | | | |
|-----|---|-----|---|
| 1. | a | 29. | d |
| 2. | a | 30. | a |
| 3. | d | 31. | c |
| 4. | d | 32. | b |
| 5. | a | 33. | c |
| 6. | c | 34. | c |
| 7. | d | 35. | a |
| 8. | b | 36. | a |
| 9. | c | 37. | c |
| 10. | a | 38. | d |
| 11. | d | 39. | a |
| 12. | b | 40. | d |
| 13. | d | 41. | c |
| 14. | b | 42. | a |
| 15. | a | 43. | c |
| 16. | d | 44. | c |
| 17. | c | 45. | d |
| 18. | a | 46. | c |
| 19. | d | 47. | b |
| 20. | a | 48. | b |
| 21. | c | 49. | d |
| 22. | d | 50. | b |
| 23. | b | 51. | a |
| 24. | d | 52. | c |
| 25. | c | 53. | a |
| 26. | a | 54. | a |
| 27. | c | 55. | b |
| 28. | d | 56. | c |

Written Test

Name _____

Date _____ Score _____

Objective 1

Define the term *circulatory system*. Write your answer on the blank lines provided beside the term below.

Circulatory system _____

Objective 2

Select from the following list the functions of the circulatory system. Place an "X" on the blank next to each correct function.

_____ a. Transports various substances to and from body cells, including oxygen, carbon dioxide, food, water, chemicals, hormones, and waste products

_____ b. Protects the body against invading organisms

_____ c. Helps regulate body temperature

_____ d. Reduces circulation of lymph through blood stream

_____ e. Maintains homeostasis

_____ f. Transports waste products to excretory organs

Objective 3

List the subsystems of the circulatory system. Write your answers on the blank lines provided below.

a. _____

b. _____

Written Test

Objective 4

Match the major organs of the circulatory system with their definitions. Write the numbers on the blanks provided.

- | | |
|----------------|----------------------|
| 1. Arteries | 6. Lymphatic vessels |
| 2. Arterioles | 7. Veins |
| 3. Capillaries | 8. Spleen |
| 4. Heart | 9. Venules |
| 5. Lymph nodes | |

- _____ a. The hollow, muscular organ that by its rhythmic contraction acts as a force-pump maintaining the circulation of the blood
- _____ b. Fine, transparent, valved channels that carry lymph and tissue fluid, are distributed through most tissues, and are characterized by a beaded appearance
- _____ c. The many blood vessels that convey blood from the capillaries to the heart
- _____ d. The tubular, branching, muscular- and elastic-walled blood vessels that carry blood from the heart through the body
- _____ e. Small, oval structures that filter lymph, fight infection, and form lymphocytes, monocytes, and plasma cells
- _____ f. A soft, highly vascular organ located between the stomach and the diaphragm and considered a part of the lymphatic system; it produces leukocytes, monocytes, lymphocytes, and plasma cells, stores blood cells, and filters out bacteria and wornout red blood cells
- _____ g. The smallest blood vessels forming networks throughout the body
- _____ h. The small terminal twigs of an artery that end in capillaries
- _____ i. Small veins and especially the minute veins connecting capillaries with larger veins

Objective 5

Distinguish among the major components of blood. Write a "B" before the description of blood plasma, an "E" before the description of erythrocytes, an "L" before the description of leukocytes, and a "T" before the description of thrombocytes. Descriptions continue on the next page.

- _____ a. Blood platelets; the tiny protoplasmic discs of the blood that assist in blood clotting
- _____ b. The liquid part of blood that serves as a source of nutrition and a means of removing waste products from the cells of the body

- _____ c. White blood cells that ingest and digest foreign particles in blood, form antibodies, and release heparin
- _____ d. Red blood cells that transport oxygen and carbon dioxide in support of respiration

Objective 6

Complete statements that describe the normal physical characteristics of blood. Write your answers on the blank lines provided in the statements below.

- a. The color of unoxygenated blood in the veins is _____ or deep red.
- b. The color of oxygenated blood in the arteries is bright _____.
- c. Blood tastes slightly _____ and salty.
- d. Blood is slightly _____, with a normal pH of 7.35 to 7.45.
- e. There are approximately _____ quarts of blood in the body of an adult.
- f. The composition of blood is 78 percent _____ and 22 percent _____.

Objective 7

List five major components of blood plasma. Write your answers on the blank lines provided below.

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____

Objective 8

Define the term *cardiovascular system*. Write your answer on the blank lines provided beside the term below.

Cardiovascular system _____

Written Test

Objective 9

Complete statements that describe the size and position of the heart. Write your answers on the blank lines provided in the statements below.

- a. The heart is a hollow, muscular organ that is about the size and shape of a person's fist and weighs _____ to _____ ounces.
- b. The heart is suspended in the thoracic cavity by vessels and lies in the mediastinum with approximately two-thirds of its mass to the left of the _____ of the body.
- c. The heart rests obliquely in the body with the right side anterior to the left side; it rests on the _____ with the apex pointing left and is positioned with the base below the second rib.
- d. The heart lies in a fibrous, loose-fitting sac called the _____.
- e. The serous pericardium consists of a parietal layer, which lines the inside of the fibrous pericardium, and a _____ layer, which adheres to the surface of the heart.
- f. Between the two layers of the pericardium is the pericardial space, which contains the pericardial fluid that lubricates the opposing surfaces of the space and allows the heart to move easily during _____.

Objective 10

List the major structures of the heart. Write your answers on the blank lines provided below.

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____

Objective 11

Select true statements concerning characteristics of the chambers of the heart. Place an "X" on the blank next to each true statement.

- _____ a. The heart is divided into three chambers.
- _____ b. The atria collect blood; the right atrium receives oxygenated blood and the left atrium receives deoxygenated blood.
- _____ c. Ventricles pump blood from the heart.
- _____ d. Ventricles consist of thicker muscle tissue than the atria, and the left ventricle is three times thicker than the right ventricle to enable it to pump blood to the body.

Objective 12

Select true statements that describe the characteristics of the major veins of the heart. Place an "X" on the blank next to each true statement.

- a. Deoxygenated blood returns to the heart from the body by the way of two large veins.
- b. The inferior vena cava carries blood from the upper part of the body.
- c. The superior and inferior venae cavae deposit deoxygenated blood into the right atrium.
- d. The right and left pulmonary veins carry deoxygenated blood back to the heart from the lungs.
- e. The pulmonary veins deposit oxygenated blood in the left atrium.

Objective 13

Complete statements that describe the characteristics of the major arteries of the heart. Write your answers on the blank lines provided in the statements below.

- a. When the heart contracts, blood leaves the right ventricle of the heart through the left pulmonary artery and the right pulmonary artery and travels to the _____.
- b. When the heart contracts, _____ blood leaves the left ventricle through the largest artery of the body.
- c. The _____ branches into smaller arteries that carry blood to all the parts of the body.

Objective 14

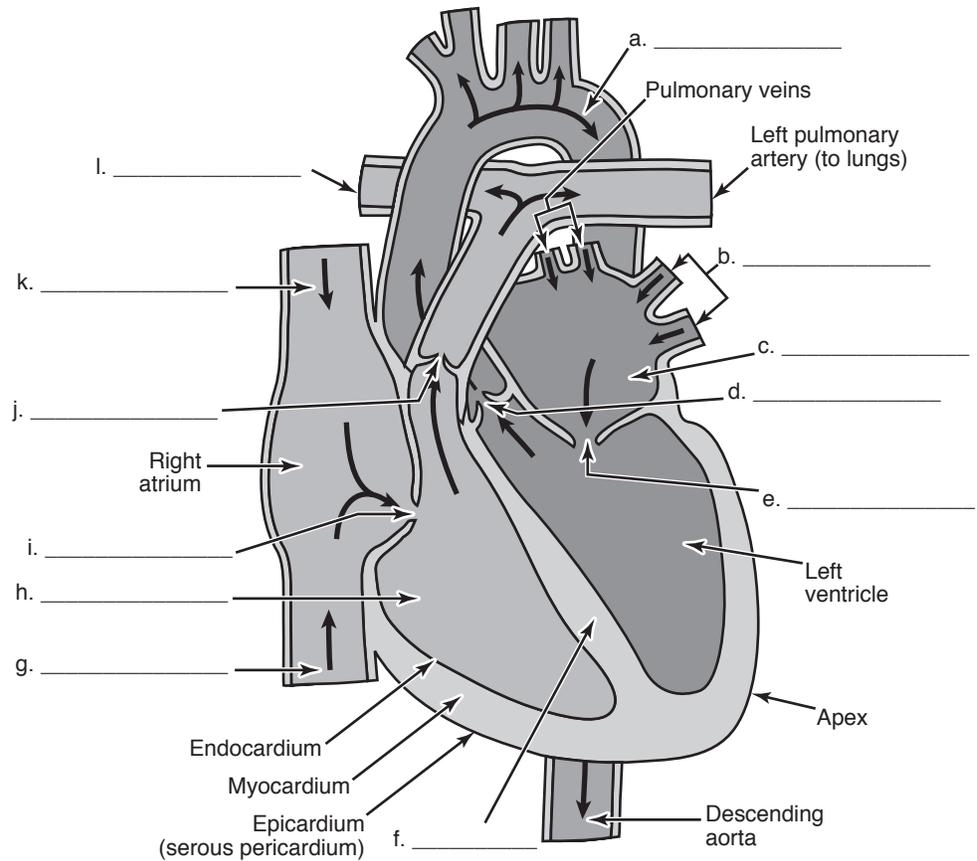
Select true statements concerning characteristics of the major valves of the heart. Place an "X" on the blank next to each true statement.

- a. There are four major valves in the heart: the tricuspid valve, the bicuspid valve, the pulmonary valve, and the aortic valve.
- b. The tricuspid valve, which is also called the mitral valve, is located between the right atrium and the right ventricle and consists of three main cusps.
- c. The bicuspid valve is located between the left atrium and the left ventricle and consists of two cusps.
- d. The pulmonary valve, which is also called the pulmonary semilunar valve, is located in the pulmonary artery and consists of three semilunar cusps that prevent blood from flowing back into the right ventricle from the pulmonary artery.
- e. The aortic valve is located between the left ventricle and the aorta and consists of three semilunar cusps that prevent blood from flowing back into the left ventricle from the aorta.

Written Test

Objective 15

Label the major structures of the heart. Write your answers on the blank lines provided beside the illustration below.



Objective 16

Define the term *vascular system*. Write your answer on the blank lines provided beside the term below.

Vascular system _____

Objective 17

Select from the following list the major structures of the vascular system. Place an "X" on the blank next to each major structure. The list continues on the next page.

- _____ a. Arteries
- _____ b. Valves
- _____ c. Arterioles
- _____ d. Capillaries

Objective 18

_____ e. Chambers

_____ f. Venules

_____ g. Veins

Match major arteries that extend from the aortic arch with their descriptions. Write the numbers on the blanks provided.

- | | |
|----------------------------|--------------------|
| 1. Right subclavian artery | 5. Axillary artery |
| 2. Left subclavian artery | 6. Brachial artery |
| 3. Right carotid artery | 7. Radial artery |
| 4. Left carotid artery | 8. Ulnar artery |

_____ a. One of a pair of the continuations of the subclavian arteries that supplies various chest muscles and arm muscles

_____ b. The main artery from the aortic arch that supplies the right side of the head, neck, and brain

_____ c. A large artery branching from the brachial artery and supplying muscles in the forearm, wrist, and hand; it has nine branches

_____ d. The main artery from the aortic arch that supplies the right arm and the surrounding area

_____ e. The principal artery of the upper arm that is the continuation of the axillary artery

_____ f. The main artery from the aortic arch that supplies the left arm and the surrounding area

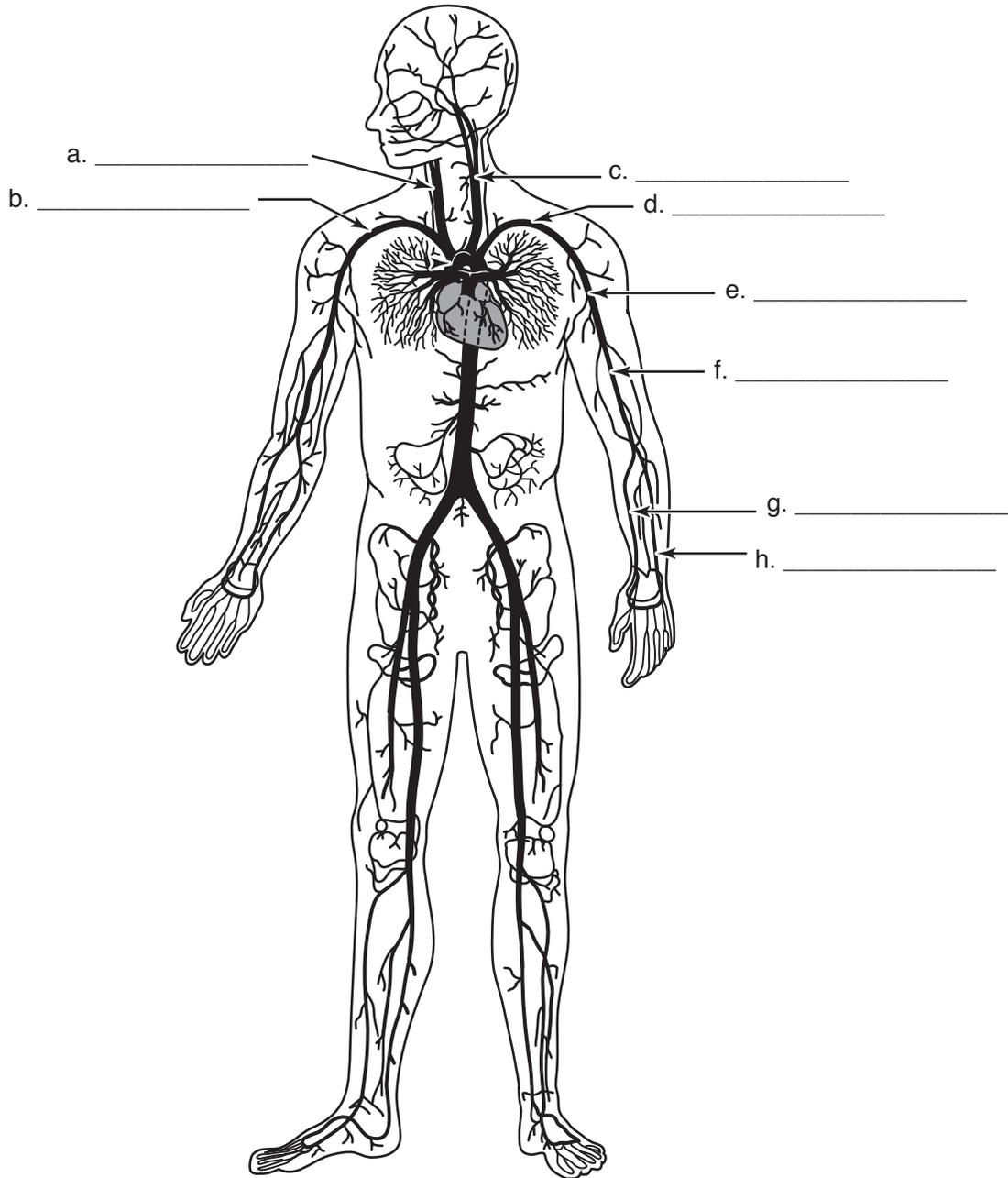
_____ g. An artery of the forearm starting at the bifurcation of the brachial artery and passing in 12 branches supplying the forearm, wrist and hand

_____ h. The main artery from the aortic arch that supplies the left side of the head, neck, and brain

Written Test

Objective 19

Label the major arteries of the systemic circulation system. Write your answers on the blank lines provided beside the illustration below.



Written Test

Objective 20

Complete statements that describe the characteristics of capillaries. Write your answers on the blank lines provided in the statements below.

- a. Capillaries connect arterioles and _____.
- b. Capillaries are minute vessels with walls that are only one _____ thick.
- c. Nutrients and oxygen move from the capillaries through the capillary walls and into the cells of the body by _____.

Objective 21

Complete statements that describe the characteristics of veins. Write your answers on the blank lines provided in the statements below.

- a. Most veins carry _____ blood to the vena cava of the heart; the pulmonary veins are an exception, as they carry _____ blood from the lungs to the heart.
- b. Veins branch into venules and venules branch into _____.
- c. The _____ layer of muscle tissue in a vein is not very well developed or very flexible.
- d. The wall of a vein is relatively thin, causing a vein to _____ when cut.
- e. Many veins contain _____ that prevent the backflow of blood.
- f. Many veins share their names with the corresponding _____.

Objective 22

Define the term *pulse point*. Write your answer on the blank lines provided beside the term below.

Pulse point _____

Objective 23

Define the term *blood pressure*. Write your answer on the blank lines provided beside the term below.

Blood pressure _____

Objective 24

Define the term *lymphatic system*. Write your answer on the blank lines provided beside the term below.

Lymphatic system _____

*Permission to duplicate this test is granted.

Answers to Written Test

Objective 1	Circulatory system—The network of channels through which the nutrient fluids of the body circulate
Objective 2	a, b, c, e, f
Objective 3	Answers may appear in any order. a. Blood circulatory system b. Lymphatic system
Objective 4	a. 4 b. 6 c. 7 d. 1 e. 5 f. 8 g. 3 h. 2 i. 9
Objective 5	a. T b. B c. L d. E
Objective 6	a. purple b. red c. metallic d. alkaline e. 6 f. water, solids
Objective 7	Any five of the following in any order: a. Water b. Electrolytes c. The nutrients glucose, amino acids, and fat d. Metabolic wastes e. Respiratory gases f. Regulatory substances, including hormones and enzymes g. Antibodies
Objective 8	Cardiovascular system—The network of anatomical structures, including the heart and the blood vessels, that pump blood throughout the body

Answers to Written Test

Objective 9	<ul style="list-style-type: none">a. 9, 13b. midlinec. diaphragmd. pericardiume. visceralf. contraction
Objective 10	Answers may appear in any order: <ul style="list-style-type: none">a. Septumb. Chambersc. Veinsd. Arteriese. Valves
Objective 11	c, d
Objective 12	a, c, e
Objective 13	<ul style="list-style-type: none">a. lungsb. oxygenatedc. aorta
Objective 14	a, c, d, e
Objective 15	<ul style="list-style-type: none">a. Aortab. Pulmonary veinsc. Left atriumd. Aortic valvee. Bicuspid valvef. Septumg. Inferior vena cavah. Right ventriclei. Tricuspid valvej. Pulmonary valvek. Superior vena caval. Right pulmonary artery
Objective 16	Vascular system—The portion of the cardiovascular system that deals with the blood vessels that allow for the circulation of blood throughout the body
Objective 17	a, c, d, f, g

Answers to Written Test

Objective 18	<ul style="list-style-type: none">a. 5b. 3c. 8d. 1e. 6f. 2g. 7h. 4
Objective 19	<ul style="list-style-type: none">a. Right carotidb. Right subclavianc. Left carotidd. Left subclaviane. Axillaryf. Brachialg. Radialh. Ulnar
Objective 20	<ul style="list-style-type: none">a. venulesb. cell layerc. osmosis
Objective 21	<ul style="list-style-type: none">a. deoxygenated, oxygenatedb. capillariesc. middled. collapsee. valvesf. arteries
Objective 22	Pulse point—Any one of the sites on the surface of the body where arterial pulsations can be easily felt
Objective 23	Blood pressure—The pressure exerted by the circulating volume of blood on the walls of the arteries, the veins, and the chambers of the heart
Objective 24	Lymphatic system—The vast, complex network of capillaries, thin vessels, valves, ducts, nodes, and organs that helps to protect and maintain the internal fluid environment of the entire body by producing, filtering, and conveying lymph and by producing various blood cells

Teacher Supplement 1 – Complete an Anticipation Guide

Evaluation Criteria	Rating
• Completion of guide before reading	_____
• Review of completed guide after reading	_____
• Group participation and discussion	_____
• Classroom discussion	_____

Basic Skills



Reading



Writing



Science



Oral Communication



Interpersonal

Directions Part 1

Before reading the materials provided and in the space to the left of each statement, place a check mark (✓) if you agree or think the statement is true.

- _____ 1. The circulatory system transports fluids through the body.
- _____ 2. Blood circulatory system and lymphatic system are two major subsystems of the circulatory system.
- _____ 3. Other names for white blood cells are leukocyte, monocyte, plasma, and lymphocyte.
- _____ 4. The muscular organ noted by its rhythmic contractions and weight of approximately 9 to 13 ounces, and acts as a force pump is the heart.
- _____ 5. The organ that produces leukocytes and filters out worn-out red blood cells is known as "lymph nodes."
- _____ 6. Three types of blood cells are found in the composition of the blood.
- _____ 7. Blood has both chemical and physical characteristics, has a pH of 7, and tastes salty.
- _____ 8. An adult has approximately 1¹/₂ gallons of blood.
- _____ 9. Blood plasma contains respiratory gases and antibodies.
- _____ 10. Veins always carry deoxygenated blood to the heart.

Teacher Supplement 1

Directions Part 2

During or after reading: add a new check mark or cross through the check marks on those statements about which you have changed your mind. You may have to put some thought into your answers. This is not an assignment where you can hunt and find the answers verbatim in the materials. Use the space under each statement to note where you found the information to support your thinking.

✓ **Note:** You may find information in several locations to support your thinking. Be prepared to defend your answers.

Directions Part 3

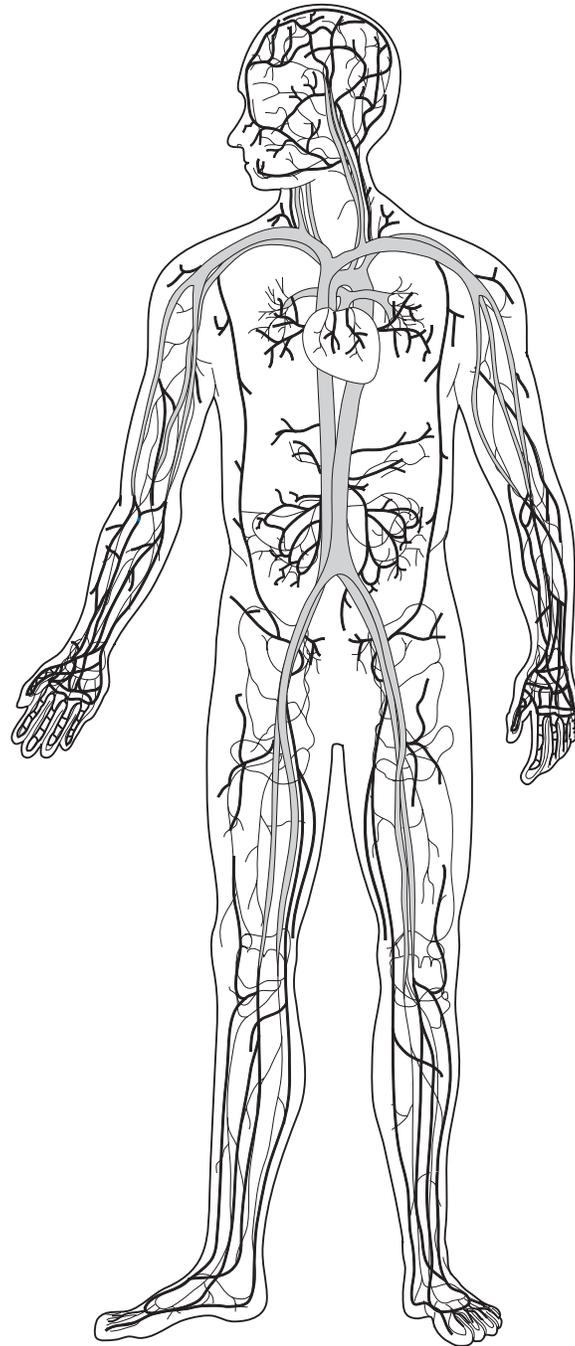
Join your team to defend your beliefs. Determine those statements that each member of the team believed to be a true statement. Using your notes written under each statement, discuss the statements that all members of the team did not agree were true and come to a group consensus.

Directions Part 4

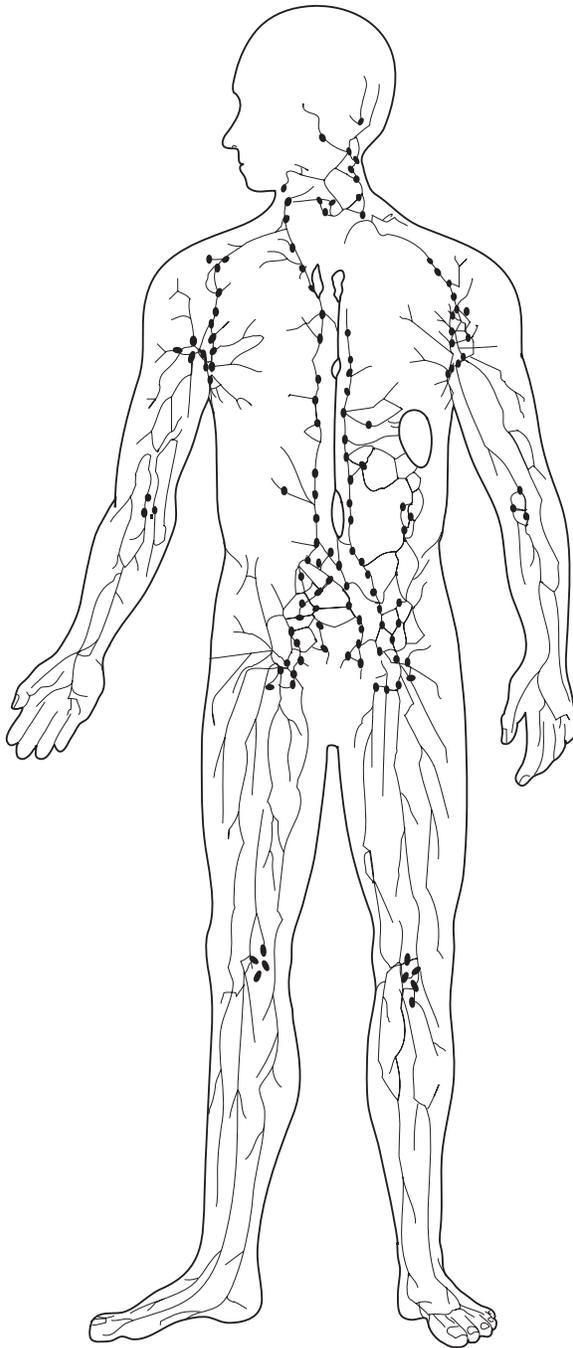
Share group results with the entire class as directed by the teacher.

Adapted from *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Mark A. Forget, Ph.D., ©2004.

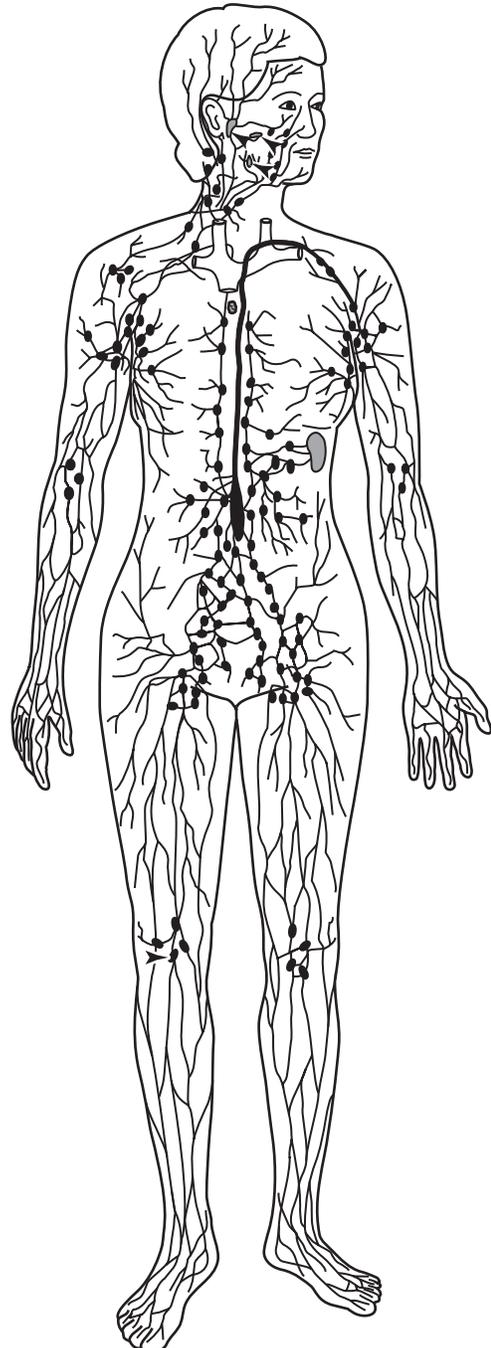
Circulatory System–Blood



Circulatory System–Lymphatic

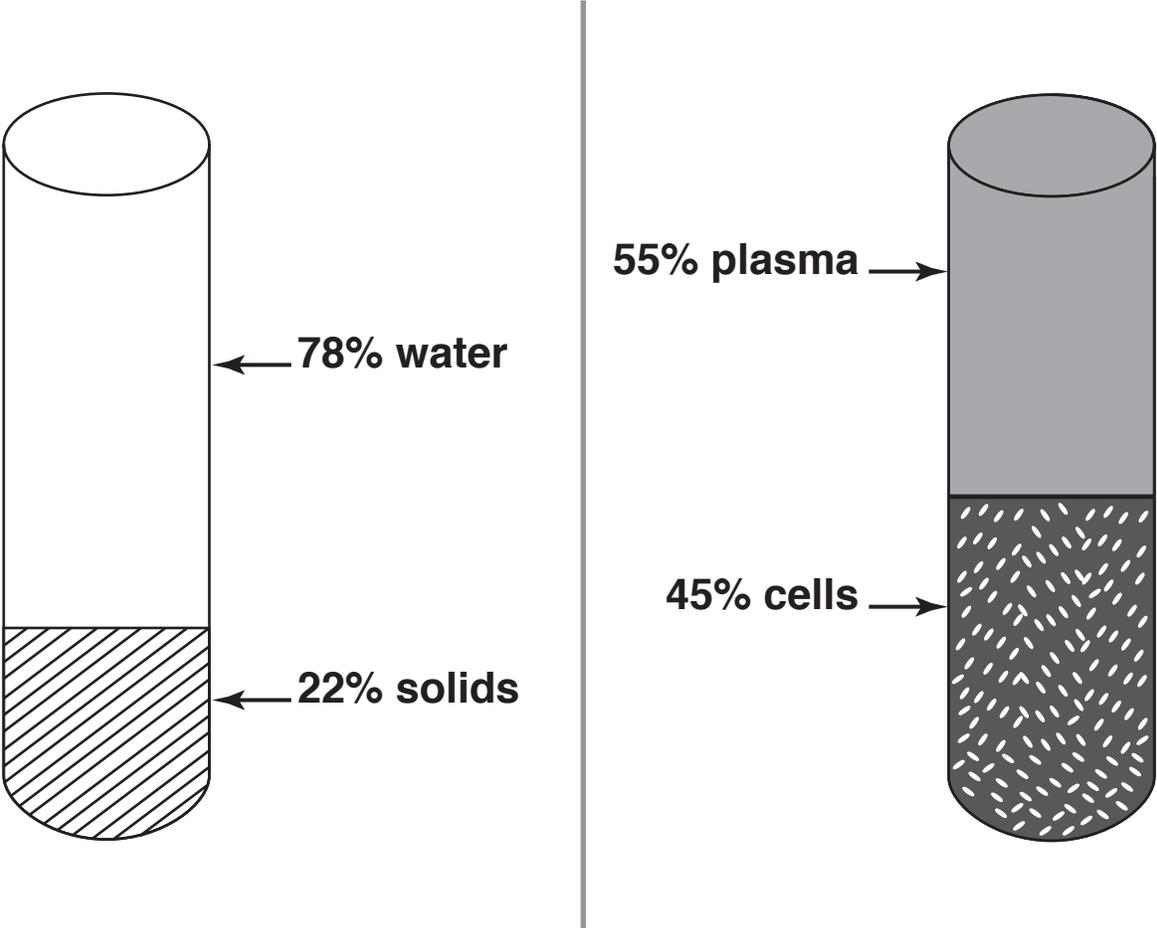


Male

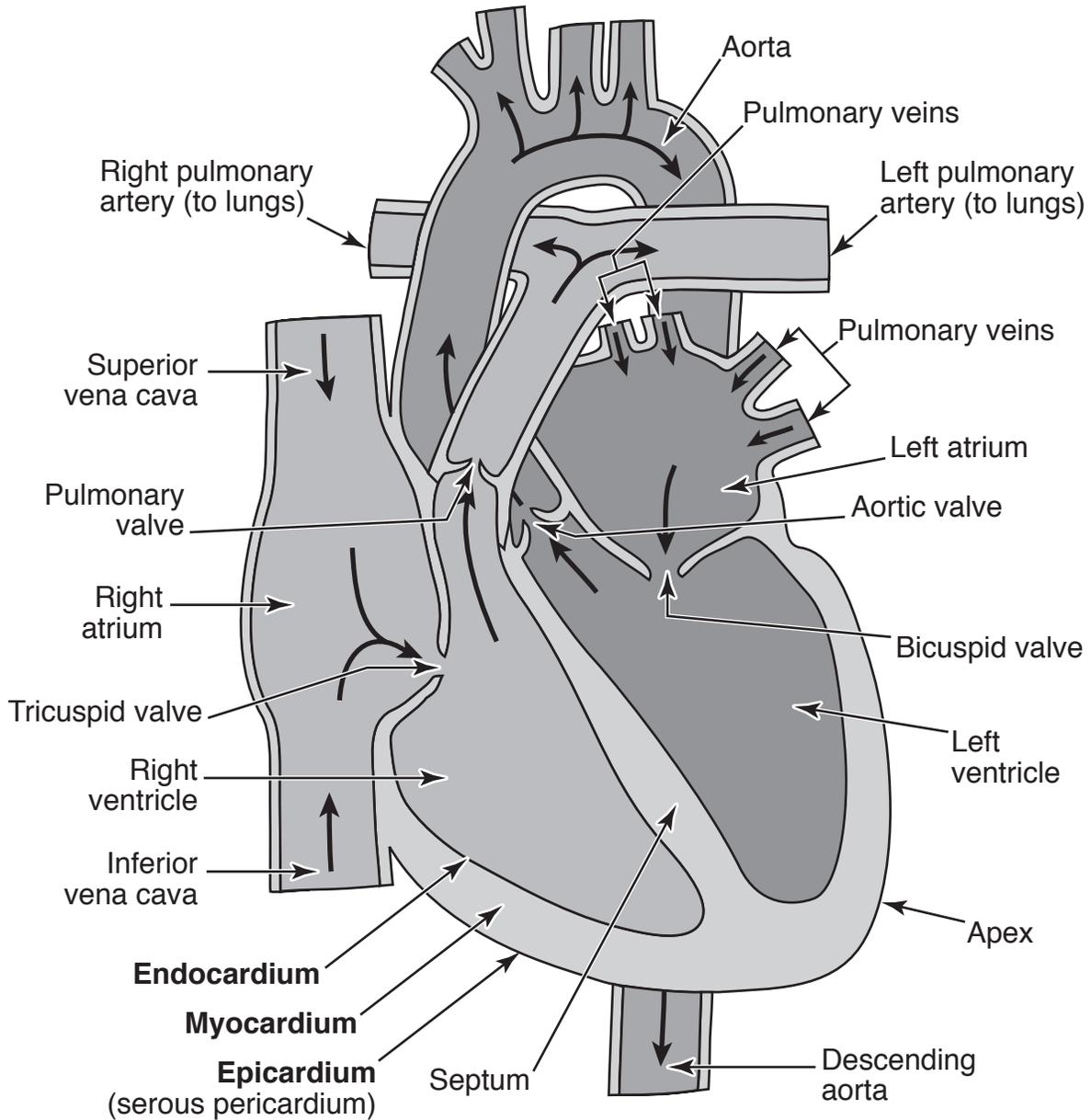


Female

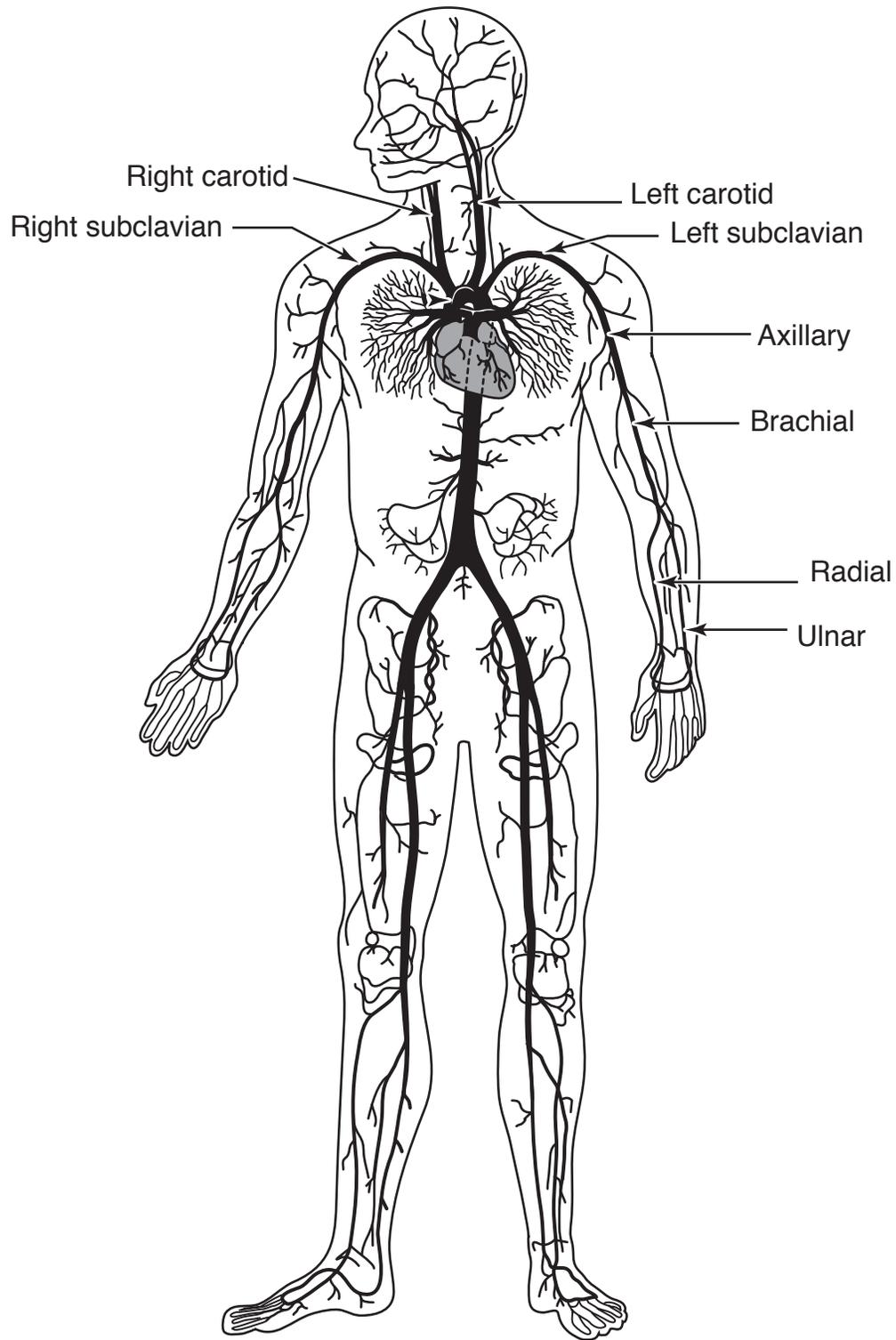
Composition of Blood



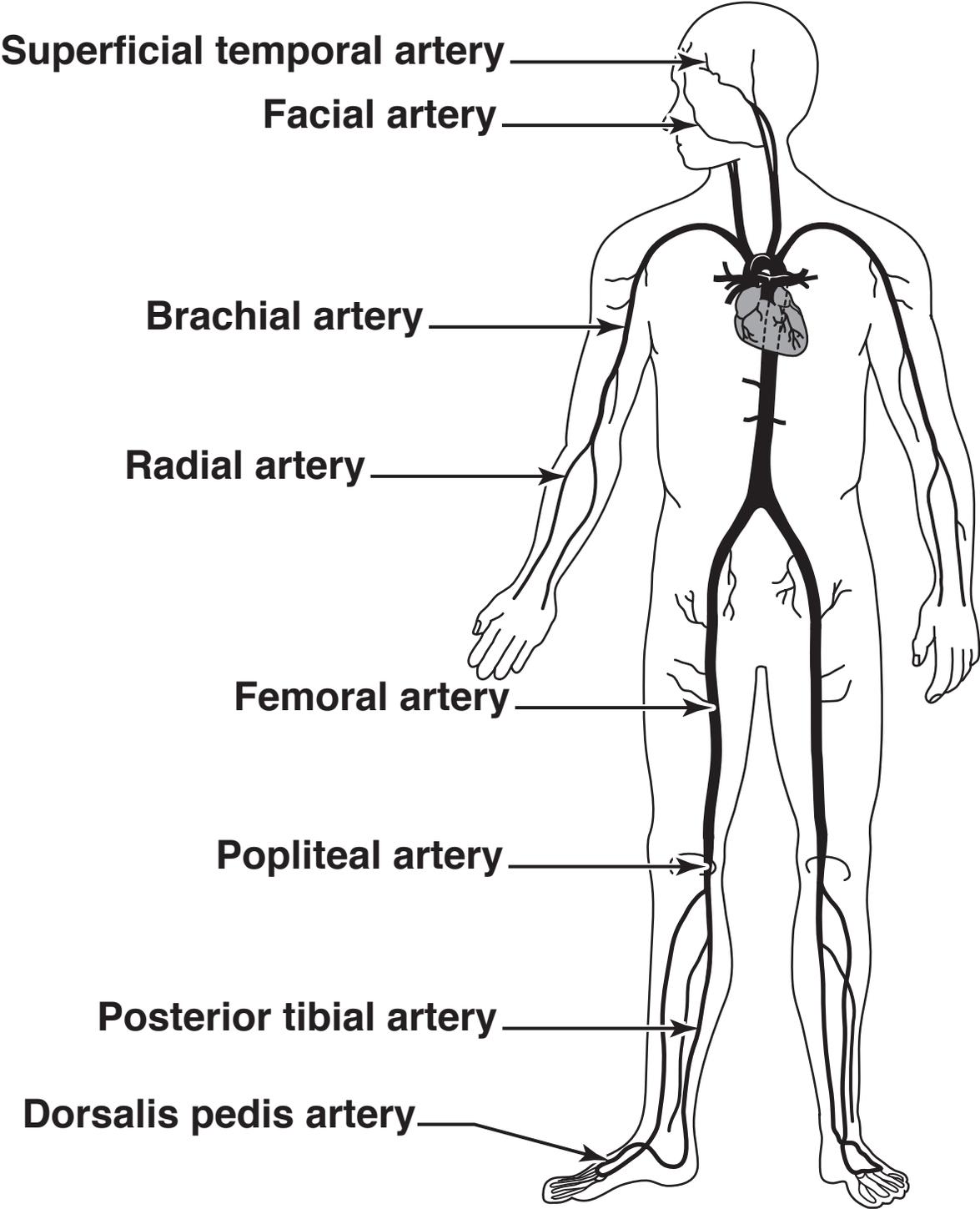
Major Structures of the Heart



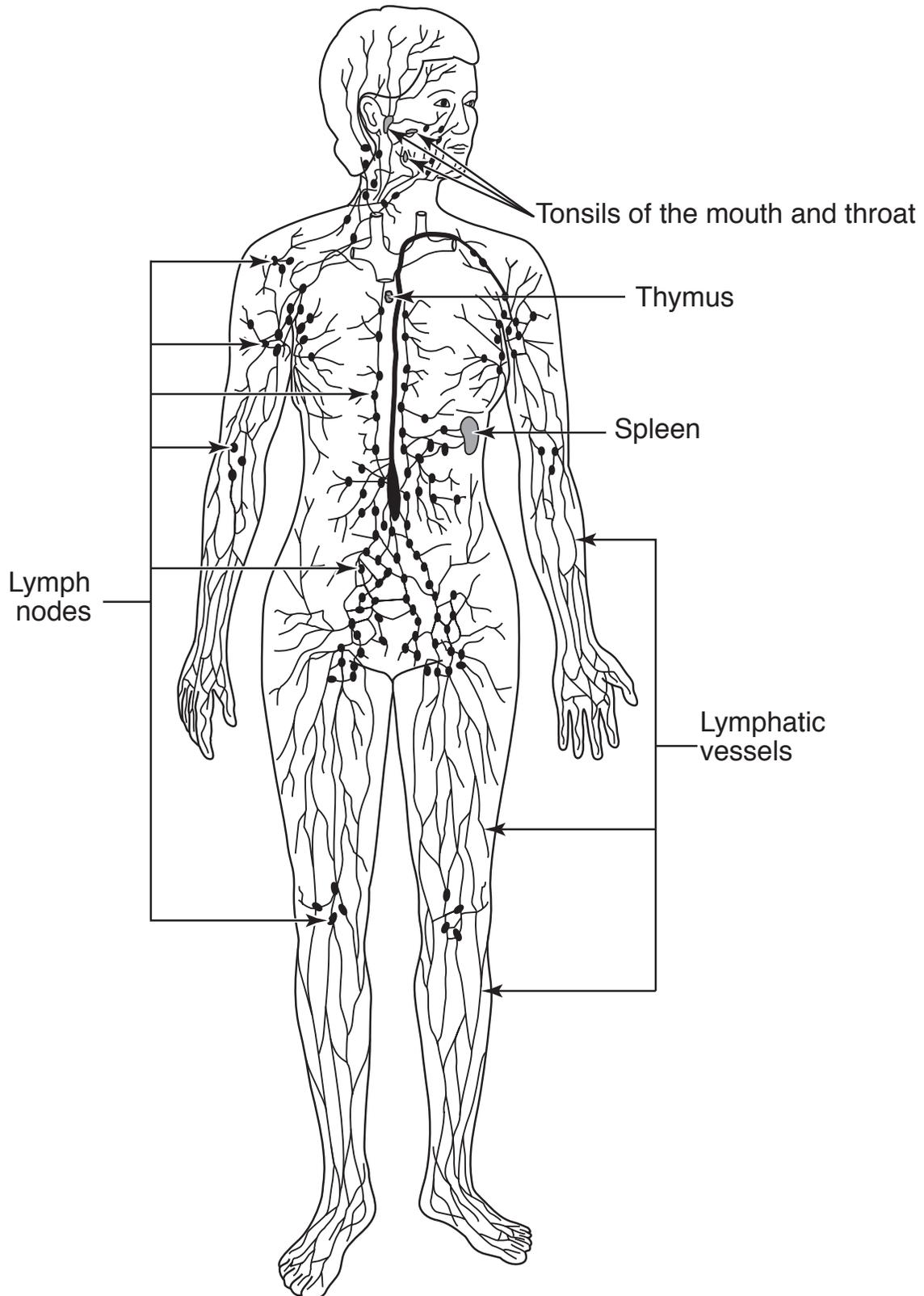
Major Arteries of the Systemic Circulation System



Common Pulse Points



Major Structures of the Lymphatic System



Module Contents

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* Assignment Sheets are located in the Student Workbook.		

Instructional
Plan

Suggested Activities

Preparation

- Read the module carefully and plan for instruction.
- Review “Teaching Suggestions.” Plan for classroom activities.
- Plan your presentation to take advantage of student learning styles and to accommodate special-needs students.
- Prepare classroom. Put up posters and charts and display articles and other references related to this module.
- Obtain resources to supplement instruction of this module. See “Resources Used in Developing This Module” and “Suggested Supplemental Resources.”
- Review the “Suggested Web Sites,” and make a list of additional sites you may have found for students to research to learn more about the respiratory, digestive, and urinary systems.
- For self-paced instruction, review Learning Activities Sheet. Go to “customizable files” link on teacher edition CD and modify as appropriate to include additional activities and/or resources available in your classroom. Make one copy for each student.
- Make copies of Teacher Supplement 1 and any teacher supplements that you have created that will be provided for each student.
- Make transparencies from the transparency masters included in this module. These appear in teacher edition only. A PowerPoint® presentation of transparencies is located on the teacher edition CD.

Delivery and Application

Module Introduction (self-paced instruction)

- Refer students to Learning Activities Sheet and module of instruction located in student guide.
- Review module contents with student.
- Have the student complete the steps in the Learning Activities Sheet.

Module Introduction (group instruction)

- Provide students with module of instruction.
- Discuss module and specific objectives.

Suggested Activities

- Discuss the information sheet. Implement teaching plan to localize, supplement, and personalize the module. Reinforce basic academic and workplace skills when applicable.
- Discuss the assignment sheets. Review with students the criteria for evaluation of these activities.

Teaching Suggestions

- ✓ **Note:** This module focuses on the respiratory, digestive, and urinary systems, specifically their organs, structures and functions in the operation of the human body.
- Use Teacher Supplement 1 with students to help them improve their literacy skills and to learn new subject matter.
- Discuss with class the importance of knowing about the respiratory, digestive, and urinary systems and how a client's health may affect the work of a cosmetologist.
- Use crossword puzzle (Assignment Sheet 1) to help reinforce the terms in objectives 1 through 11.
- To supplement Objective 1 and to introduce the module, have the students take a couple of deep breaths and then hold their breath to see how long they can do so. You may wish to instruct the students not to overdo it to the point of passing out. Have the students think about their need to breathe, how they have some control over how often and deeply they breathe, and how they will find that their bodies will take over that control to support its need for oxygen. Point out that this is the role of the respiratory system.
- For Objective 3, use illustrations and models to discuss the structure of the nose and nasal passages. Have students pinch their nostrils together and talk or taste foods to determine if the nose plays a role in these functions.
- For Objective 3, use illustrations and models to discuss the structure and function of the lungs.
- For Objective 4 and Objective 5, serve the class a snack, including a variety of food groups, such as cheese or peanut butter and crackers, vegetables, fruit, and sweets. Ask students the purpose of eating and lead them into thinking about how food eventually gets converted into a form of energy and how some by-products are converted to fat.
- For Objective 5, discuss the functions of the digestive system. Help students to understand the concepts of nutrients and calories in relationship to what they eat.
- Explain to students that the digestive system involves more organs than any other system they have studied.

Suggested Activities

- Use illustrations and models to discuss the major organs and structures of the urinary system as presented in Objective 11.
- Read the directions for Assignment Sheet 2 and be prepared to discuss with class. Have the room set up with two rows of chairs, facing each other in two straight lines. Make sure there are enough chairs for students.
- Use module review (Assignment Sheet 4) to assess student knowledge of the respiratory, digestive, and urinary systems.

Evaluation

- Make copies of the written test. Using the Word® file included on the teacher edition CD, add or modify test items as needed. The written test serves as both a pretest and posttest to assist in measuring each student's competency gains.
- Give and evaluate pretest. Modify lesson plan to include additional instruction for those areas where students were deficient.
- Evaluate the assignment sheets. Rate the student using the criteria listed on each assignment sheet. See Answers to Assignment Sheets for correct answers where applicable. If the student's performance is unacceptable, have the student review the appropriate materials and complete the assignment again.
- Give and evaluate the posttest.
- Meet individually with students to evaluate their progress through this module of instruction and indicate to them possible areas for improvement.
- Reteach and retest as required.

Resources Used in Developing This Module

Print Media

- *Anatomy and Physiology*. Stillwater, OK: Multistate Academic and Vocational Curriculum Consortium, Inc., 2002.
- Gray, Henry. *Gray's Anatomy*, 39th ed. New York: Mosby, 2004.
- Gyls, Barbara A., and Regina Masters. *Medical Terminology Simplified*, 3rd ed. Philadelphia: F.A. Davis Company, 2005.
- Scanlon, Valerie C. and Tina Sanders. *Essentials of Anatomy and Physiology*, 4th ed. Philadelphia: F.A. Davis Company, 2002.
- Thibodeau, Gary A., and Kevin T. Patton. *Anatomy and Physiology*, 5th ed. St. Louis: Mosby, 2002.

Suggested Activities

Suggested Supplemental Resources

Print Media

- *Basic Operator*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2006.
- *Basic Esthetician*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.
- *Basic Manicurist*. Oklahoma Department of Career and Technology Education, Curriculum and Instructional Materials Center; Stillwater, OK, 2007.
- Forget, Mark A. *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Victoria, British Columbia; Trafford Publishing, 2004.

Suggested Web Sites

✓ **Note:** The following web sites offer general information about anatomy and physiology and generally cover more than one body system.

- http://www.ama-assn.org/insight/gen_hlth/atlas/newatlas/lung.htm

This site provides a map of the respiratory system that will allow students to learn about the structure of the lungs and other components. The site includes interactive illustrations.

- <http://library.thinkquest.org/19347/respiratory.htm>

This web site offers a number of pages that provide an overview of the respiratory system, including anatomy, physiology, diseases, and related topics.

- http://www.vilenski.com/science/humanbody/hb_html/respiratory.html

The illustrations, links, and interesting facts provided by this web site will allow students to explore many different aspects of the respiratory system.

- http://www.msms.doe.k12.ms.us/biology/anatomy/digestive/digestive_frame.htm.

This site provides good illustrations that address the digestive system organ by organ.

- <http://www-sci.lib.uci.edu/~martindale/MedicalAnatomy.html>

This site provides a wealth of information and many useful graphics about human anatomy.

Suggested Activities

- <http://en.wikipedia.org/wiki/integumentarysystem>

This site provides great information on the various body systems that make up the human body. To move from one body system to another, simply change the system name in the Web address. For example, change "integumentary" to "muscular" to go to the section of this on-line encyclopedia that addresses that system.

- <http://dir.yahoo.com/science/biology/anatomy>

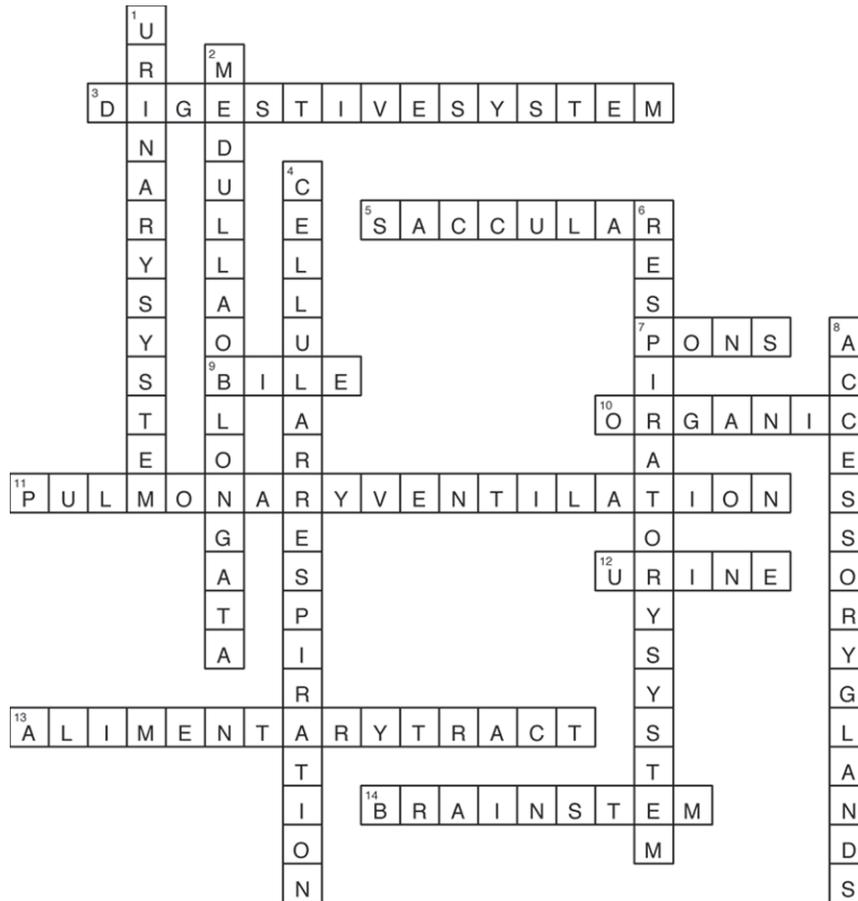
By going to this site, you will have access to a variety of Web addresses that cover the body systems in the human anatomy. Click on the body system you wish to explore to access Web sites that offer good information as well as illustrations to further explore the human body.

- ✓ **Note:** Web-site addresses were accurate and all content on referenced web sites was appropriate during development and production of this product. However, web sites sometimes change; MAVCC takes no responsibility for a site's content. The inclusion of a web site does not constitute an endorsement of that site's other pages, products, or owners. You are encouraged to verify all web sites prior to use.

Answers to Assignment Sheets

Assignment
Sheet 1

Answers to Crossword Puzzle (Objectives 1–11)



Assignment
Sheet 2

Participate in a "Face Off"

This assignment sheet should be evaluated by the instructor using the evaluation criteria stated on the assignment sheet.

Assignment
Sheet 3

Analyze Cosmetology Scenarios

Answers should include key points but may be in the student's own words

Answers to Scenario 1

1. What body system may be involved in the difficulties Ms. Naifeh is experiencing?

Respiratory system

Answers to Assignment Sheets

2. What should you do?

Be gentle. Limit the moves Ms. Naifeh needs to make in the salon. Position her away from chemical services. Allow her to use the oxygen as needed. Be patient. Continue the service.

Answers to Scenario 2

1. What body system is involved?

Urinary system

2. What should you do?

Be patient. Reassure Ms. Carr. Do not complete the service as it would not be possible in Ms. Carr's condition. Ask her to see a doctor and return for the service when it can be more enjoyable for her.

Answers to Scenario 3

1. What body system is the gallbladder a part?

Digestive system

2. What should you do?

Continue with the service as scheduled.

Answers to Scenario 4

1. What body system may be involved?

Digestive system

2. What part of the system may be involved?

Liver

3. What do you think could be the condition Ms. Zarrabi is experiencing?

Gallbladder problems, liver problems, or hepatitis

4. What do you do?

Discontinue service. Calm Ms. Zarrabi. Encourage her to see a physician immediately or go to the emergency room. Ask her to call the salon and let you know what the problem is. Sterilize and sanitize everything that Ms. Zarrabi has come into contact with in the salon. Follow up with Ms. Zarrabi and her physician to find the problem.

Answers to Assignment Sheets

Assignment Sheet 4

5. Why should you follow up on what the physician diagnosed as the problem?

If Ms. Zarrabi has hepatitis, you and others in the salon may need to take further precautions, including contacting any clients that Ms. Zarrabi may have come in contact with.

Answers to Module 10 Review

- | | |
|-------|-------|
| 1. c | 13. a |
| 2. b | 14. a |
| 3. a | 15. a |
| 4. d | 16. d |
| 5. c | 17. d |
| 6. d | 18. b |
| 7. d | 19. c |
| 8. b | 20. a |
| 9. a | 21. b |
| 10. b | 22. a |
| 11. a | 23. a |
| 12. c | 24. b |

Written Test

Name _____

Date _____ Score _____

Objective 1

Define the term *respiratory system*. Write your answer on the blank lines provided beside the term below.

Respiratory system _____

Objective 2

Complete statements that describe the characteristics of pulmonary ventilation. Write your answers on the blank lines provided in the statements below.

- a. The _____ portion of pulmonary ventilation is referred to as *breathing*.
- b. There are two stages to breathing: _____ and _____.
- c. Breathing is controlled by the _____ and the pons of the brainstem.
- d. The major regulator of respiration is the carbon-dioxide level in the blood; high concentrations of carbon dioxide _____ the rate of respiration, while decreased concentrations of carbon dioxide _____ the rate of respiration.

Objective 3

Match major organs and structures of the respiratory system with their descriptions. Write the numbers on the blanks provided. Definitions continue on the next page.

- | | | |
|------------|------------|------------------------|
| 1. Nose | 4. Trachea | 7. Diaphragm |
| 2. Pharynx | 5. Bronchi | 8. Intercostal muscles |
| 3. Larynx | 6. Lungs | |

_____ a. The large air passages in the lungs through which pass inspired air and exhaled waste gases

_____ b. The throat; the muscular, tubular structure that extends from the base of the skull to the esophagus and serves as a passageway for both the respiratory and digestive tracts

Written Test

- _____ c. The muscles between the ribs
- _____ d. The structure that protrudes from the anterior portion of the skull and serves as part of the passageway for air to and from the lungs
- _____ e. The organ of voice that is part of the air passageway
- _____ f. The dome-shaped partition of muscle and connective tissue that separates the thoracic and the abdominal cavities and aids respiration by moving up and down
- _____ g. The light, spongy, highly elastic, saccular organs located in the thoracic cavity and constituting the main components of the respiratory system for inspiring air and exhaling carbon dioxide
- _____ h. The windpipe; the nearly cylindrical tube in the neck that extends from the lower end of the larynx to the point where it divides into the two bronchi of the lungs

Objective 4

Define the term *digestive system*. Write your answer on the blank lines provided beside the term below.

Digestive system _____

Objective 5

State three functions of the digestive system. Write your answers on the blank lines provided below.

- a. _____

- b. _____

- c. _____

Objective 6

Define the term *accessory glands*. Write your answer on the blank lines provided beside the term below.

Accessory glands _____

Objective 7

Match major organs and structures of the digestive system with their descriptions. Write the numbers on the blanks provided.

- | | | |
|--------------|----------------|--------------------|
| 1. Mouth | 4. Liver | 7. Pancreas |
| 2. Pharynx | 5. Stomach | 8. Small intestine |
| 3. Esophagus | 6. Gallbladder | 9. Large intestine |

- _____ a. It is shaped like an irregular hemisphere and located beneath the diaphragm in the right upper quadrant of the abdominal cavity
- _____ b. The fish-shaped gland that lies posterior and slightly inferior to the stomach and secretes various substances
- _____ c. The muscular canal, about ten inches long; is the narrowest part of the alimentary tract
- _____ d. The pear-shaped gland located on the surface of the liver and serving as a reservoir for bile
- _____ e. The nearly oval oral cavity at the anterior end of the alimentary tract
- _____ f. The major organ of digestion that receives partially processed food and drink
- _____ g. The throat; the tubular structure that extends from the base of the skull to the esophagus and serves as a passageway for the respiratory and alimentary tracts
- _____ h. Its functions are to absorb water, minerals, and vitamins and eliminate waste
- _____ i. The longest portion of the alimentary tract; most digestion and nutrient absorption occurs here

Written Test

Objective 8

Select from the following list the functions of the liver. Place an “X” on the blank next to the correct functions.

- a. Converts excess nutrients into fat for later use
- b. Regulates blood volume
- c. Manufactures and excretes urine
- d. Manufactures antibodies
- e. Produces body heat
- f. Converts nutrients into energy at the cellular level
- g. Assists in regulation of water, electrolyte, and acid-base balance of the body
- h. Manufactures cholesterol
- i. Produces bile, which is stored in the gallbladder and released when needed for the digestive process
- j. Detoxifies harmful substances, such as drugs and poisons, before they make their way to the heart

Objective 9

Define the term *urinary system*. Write your answer on the blank lines provided beside the term below.

Urinary system _____

Objective 10

Select from the following list the functions of the urinary system. Place an “X” on the blank next to the correct functions.

- a. Manufactures and excretes urine
- b. Filters the blood by removing various toxins, metabolic waste products, and some water
- c. Produces body heat
- d. Influences blood pressure
- e. Assists in regulation of water, electrolyte, and acid-base balance of the body
- f. Regulates blood volume
- g. Manufactures antibodies

Objective 11

Match major organs and structures of the urinary system with their descriptions. Write the numbers on the blanks provided.

- | | |
|-----------|--------------------|
| 1. Kidney | 3. Urinary bladder |
| 2. Ureter | 4. Urethra |

- _____ a. The small, tubular structure that drains urine from the bladder
- _____ b. One of a pair of thick-walled tubes that carries urine from the kidney into the urinary bladder
- _____ c. One of a pair of bean-shaped urinary organs in the dorsal part of the abdomen
- _____ d. The muscular membranous sac in the pelvis that stores urine for discharge through the urethra

***Permission to duplicate this test is granted.**

Answers to Written Test

Objective 1	Respiratory system—The complex of organs and structures that performs the pulmonary ventilation of the body and cellular respiration
Objective 2	<ul style="list-style-type: none">a. mechanicalb. inhalation, exhalationc. medulla oblongatad. increase, slow
Objective 3	<ul style="list-style-type: none">a. 5b. 2c. 8d. 1e. 3f. 7g. 6h. 4
Objective 4	Digestive system—The organs, structures, and accessory glands of the digestive tube of the body through which food passes
Objective 5	Answers should include any three of the following. Answers may appear in any order: <ul style="list-style-type: none">a. To convert the complex organic-compound molecules of ingested food into simple organic and inorganic compounds that are capable of being transported by the circulatory and lymphatic systems and being used by cells to produce energyb. To convert nutrients into energy at the cellular levelc. To convert excess nutrients into fat for later used. To eliminate from the body the by-products of digestion that are not used by cells or stored
Objective 6	Accessory glands—The glands of the digestive system that secrete the digestive enzymes that are used by the digestive system to break down food substances in preparation for absorption into the bloodstream before carrying the waste to the intestines for excretion

Answers to Written Test

Objective 7

- a. 4
- b. 7
- c. 3
- d. 6
- e. 1
- f. 5
- g. 2
- h. 9
- i. 8

Objective 8

b, d, e, h, i, j

Objective 9

Urinary system—All of the organs involved in the secretion and elimination of urine

Objective 10

a, b, d, e

Objective 11

- a. 4
- b. 2
- c. 1
- d. 3

Teacher Supplement 1 – Complete an Anticipation Guide

Evaluation Criteria	Rating
• Completion of guide before reading	_____
• Review of completed guide after reading	_____
• Group participation and discussion	_____
• Classroom discussion	_____

Basic Skills



Reading



Writing



Science



Oral Communication



Interpersonal

Directions Part 1

Before reading the materials provided and in the space to the left of each statement, place a check mark (✓) if you agree or think the statement is true.

- _____ 1. During the act of pulmonary ventilation two chemical reactions take place.
- _____ 2. Even though pulmonary ventilation is mechanical, the medulla will force the respiratory system to breathe.
- _____ 3. The major regulator of respiration is the carbon dioxide level in the blood, amount of exercise, excitement, high altitudes, and certain diseases.
- _____ 4. A client who speaks only with a raspy, harsh sounding whisper and has had throat surgery, possibly had surgery on the pharynx.
- _____ 5. The use of oxygen by cells in the body produces carbon dioxide.
- _____ 6. The brainstem is a part of the respiratory system.
- _____ 7. Both lungs and the diaphragm expand simultaneously.
- _____ 8. The urinary system filters the blood.
- _____ 9. The liver is a fish-shaped organ, weighs approximately 3 to 4 pounds, and changes proteins into urea for elimination.
- _____ 10. The urethra found in a male is the same as in a female.

Teacher Supplement 1

Directions Part 2

During or after reading: add a new check mark or cross through the check marks on those statements about which you have changed your mind. You may have to put some thought into your answers. This is not an assignment where you can hunt and find the answers verbatim in the materials. Use the space under each statement to note where you found the information to support your thinking.

✓ **Note:** You may find information in several locations to support your thinking. Be prepared to defend your answers.

Directions Part 3

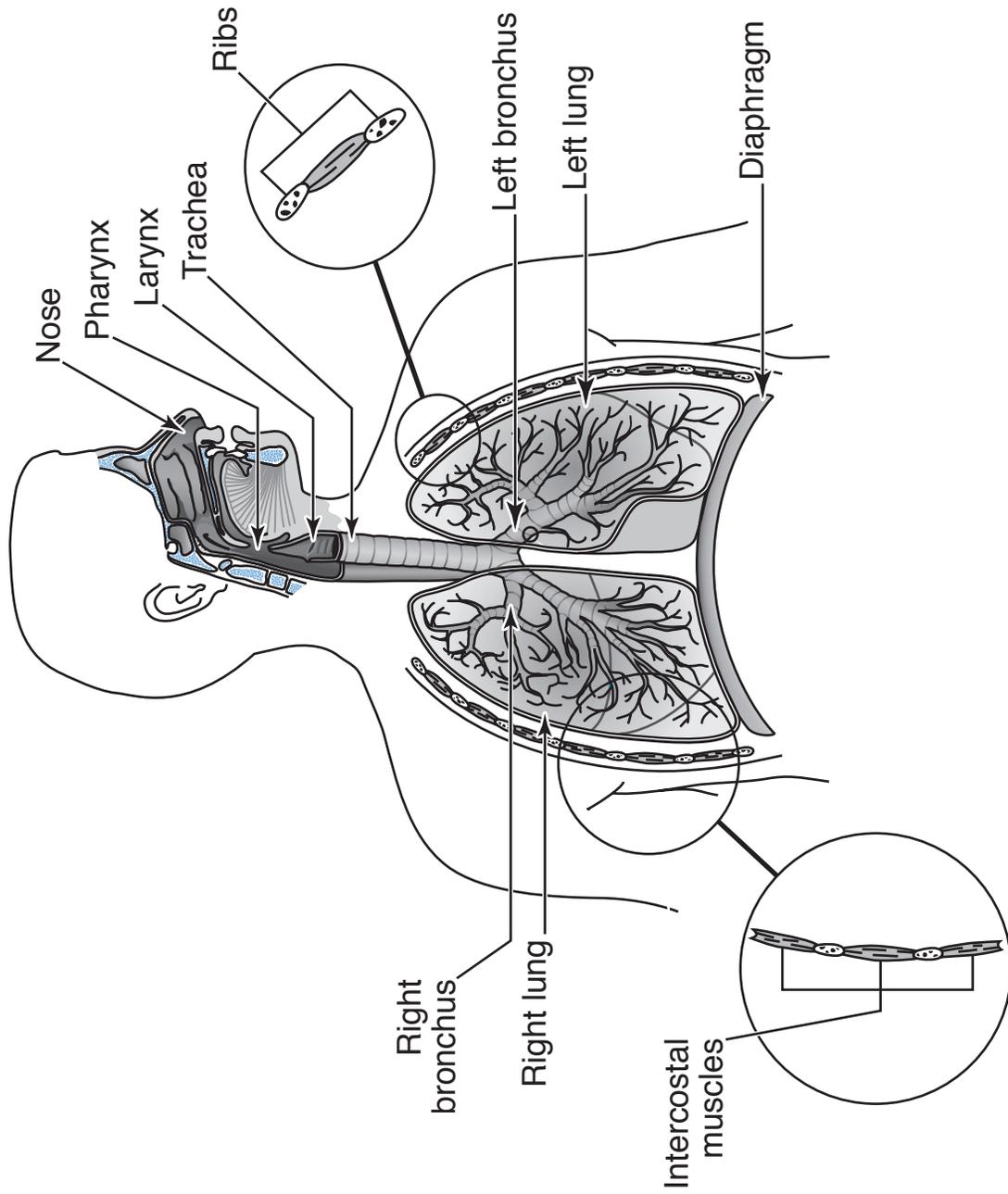
Join your team to defend your beliefs. Determine those statements that each member of the team believed to be a true statement. Using your notes written under each statement, discuss the statements that all members of the team did not agree were true and come to a group consensus.

Directions Part 4

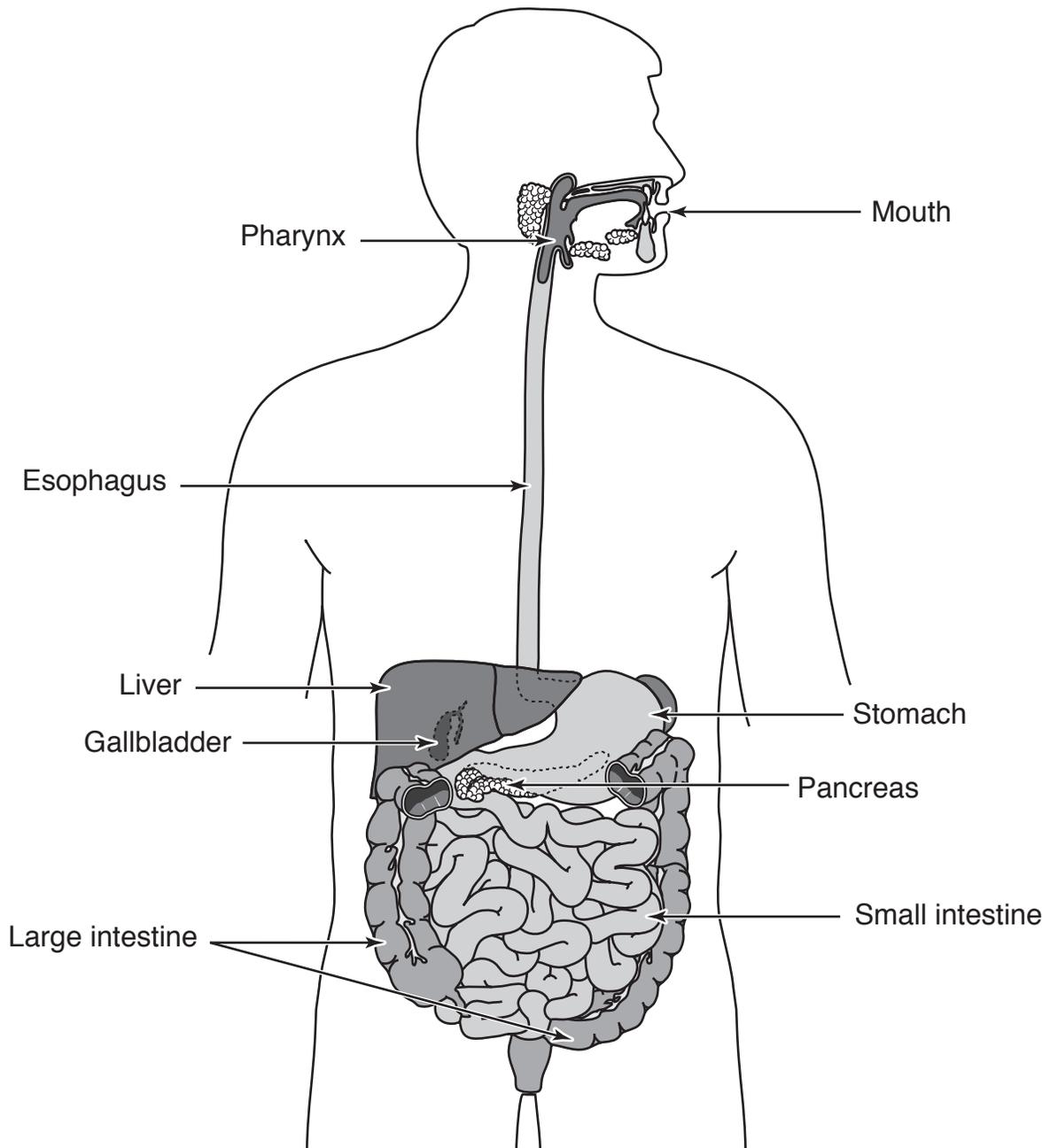
Share group results with the entire class as directed by the teacher.

Adapted from *MAX Teaching With Reading and Writing: Classroom Activities for Helping Students Learn New Subject Matter While Acquiring Literacy Skills*. Mark A. Forget, Ph.D., ©2004.

Major Organs and Structures of the Respiratory System



Major Organs and Structures of the Digestive System



Major Organs and Structures of the Urinary System

